Changes for the Better

MITSUBISHI ELECTRIC

SPLIT-TYPE, AIR TO WATER HEAT PUMP

October 2012

No.OCH533
REVISED EDITION-A

SERVICE MANUAL

R410A

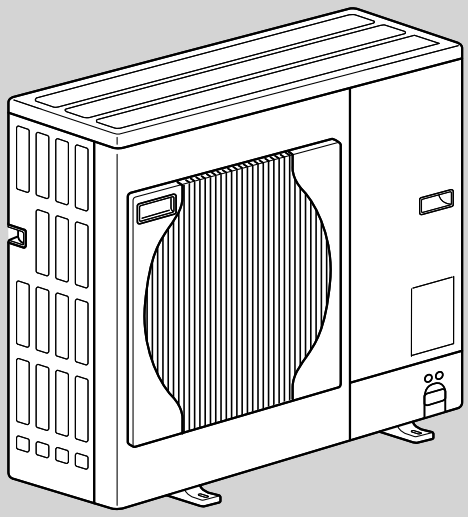
Outdoor unit

[Model names]	[Service ref.]
PUHZ-SW75VHA	PUHZ-SW75VHA.UK
PUHZ-SW100VHA	PUHZ-SW100VHA.UK
PUHZ-SW100YHA	PUHZ-SW100YHA.UK
PUHZ-SW120VHA	PUHZ-SW120VHA.UK
PUHZ-SW120YHA	PUHZ-SW120YHA.UK
Salt proof model	
PUHZ-SW75VHA-BS	PUHZ-SW75VHA-BS.UK
PUHZ-SW100VHA-BS	PUHZ-SW100VHA-BS.UK
PUHZ-SW100YHA-BS	PUHZ-SW100YHA-BS.UK
PUHZ-SW120VHA-BS	PUHZ-SW120VHA-BS.UK
PUHZ-SW120YHA-BS	PUHZ-SW120YHA-BS.UK

Revision:
- The function description of SW7-3, 7-4 and 7-5 (Page 52) have been corrected in REVISED EDITION-A.

- Please void OCH533.

Note:
- This manual describes only service data of the outdoor units.



PUHZ-SW75VHA.UK
PUHZ-SW75VHA-BS.UK

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PARTS CATALOG (OCB533)

1 REFERENCE MANUAL

INDOOR UNIT SERVICE MANUAL

Model name	Service ref.	Service manual No.
EHST20C-VM6HB EHST20C-YM9HB EHST20C-VM6B EHST20C-YM9B EHST20C-VM6EB EHST20C-YM9EB EHST20C-VM6SB EHPT20X-VM2HB EHPT20X-VM6HB EHPT20X-YM9HB EHPT20X-VM6B EHPT20X-YM9B	EHST20C-VM6HB.UK EHST20C-YM9HB.UK EHST20C-VM6B.UK EHST20C-YM9B.UK EHST20C-VM6EB.UK EHST20C-YM9EB.UK EHST20C-VM6SB.UK EHPT20X-VM2HB.UK EHPT20X-VM6HB.UK EHPT20X-YM9HB.UK EHPT20X-VM6B.UK EHPT20X-YM9B.UK	OCH531
EHSC-VM6B EHSC-YM9B EHSC-VM6EB EHSC-YM9EB EHPX-VM2B EHPX-VM6B EHPX-YM9B ERSC-VM2B	EHSC-VM6B.UK EHSC-YM9B.UK EHSC-VM6EB.UK EHSC-YM9EB.UK EHPX-VM2B.UK EHPX-VM6B.UK EHPX-YM9B.UK ERSC-VM2B.UK	OCH532

2 SAFETY PRECAUTION

2-1. ALWAYS OBSERVE FOR SAFETY

Before obtaining access to terminal, all supply circuits must disconnected.

Preparation before the repair service.

- Prepare the proper tools.
- Prepare the proper protectors.
- Provide adequate ventilation.
- After stopping the operation of the air conditioner, turn off the power-supply breaker.
- Discharge the condenser before the work involving the electric parts.

Precautions during the repair service.

- Do not perform the work involving the electric parts with wet hands.
- Do not pour water into the electric parts.
- Do not touch the refrigerant.
- Do not touch the hot or cold areas in the refrigerating cycle.
- When the repair or the inspection of the circuit needs to be done without turning off the power, exercise great caution not to touch the live parts.

2-2. CAUTIONS RELATED TO NEW REFRIGERANT

Cautions for units utilizing refrigerant R410A

Use new refrigerant pipes.

In case of using the existing pipes for R22, be careful with the followings.
· Be sure to perform replacement operation before test run.
· Change flare nut to the one provided with this product. Use a newly flared pipe.
· Avoid using thin pipes.

Make sure that the inside and outside of refrigerant piping is clean and it has no contamination such as sulfur hazardous for use, oxides, dirt, shaving particles, etc.
In addition, use pipes with specified thickness.

Contamination inside refrigerant piping can cause deterioration of refrigerant oil etc.

Store the piping indoors, and both ends of the piping sealed until just before brazing.
(Leave elbow joints, etc. in their packaging.)

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

Use ester oil, ether oil or alkylbenzene oil (small amount) as the refrigerant oil applied to flares and flange connections.

If large amount of mineral oil enters, that can cause deterioration of refrigerant oil etc.

Charge refrigerant from liquid phase of gas cylinder.

If the refrigerant is charged from gas phase, composition change may occur in refrigerant and the efficiency will be lowered.

Ventilate the room if refrigerant leaks during operation. If refrigerant comes into contact with a flame, poisonous gases will be released.

Do not use refrigerant other than R410A.

If other refrigerant (R22 etc.) is used, chlorine in refrigerant can cause deterioration of refrigerant oil etc.

Use a vacuum pump with a reverse flow check valve.

Vacuum pump oil may flow back into refrigerant cycle and that can cause deterioration of refrigerant oil etc.

Use the following tools specifically designed for use with R410A refrigerant.

The following tools are necessary to use R410A refrigerant.

Tools for R410A	
Gauge manifold	Flare tool
Charge hose	Size adjustment gauge
Gas leak detector	Vacuum pump adaptor
Torque wrench	Electronic refrigerant charging scale

Handle tools with care.

If dirt, dust or moisture enters into refrigerant cycle, that can cause deterioration of refrigerant oil or malfunction of compressor.

Do not use a charging cylinder.

If a charging cylinder is used, the composition of refrigerant will change and the efficiency will be lowered.

Use the specified refrigerant only.

Never use any refrigerant other than that specified.
Doing so may cause a burst, an explosion, or fire when the unit is being used, serviced, or disposed of.
Correct refrigerant is specified in the manuals and on the spec labels provided with our products.
We will not be held responsible for mechanical failure, system malfunction, unit breakdown or accidents caused by failure to follow the instructions.

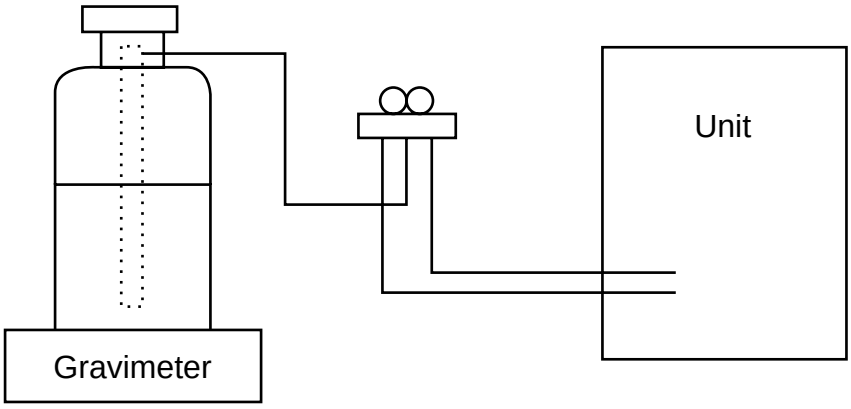
[1] Cautions for service

(1) Perform service after recovering the refrigerant left in unit completely.
(2) Do not release refrigerant in the air.
(3) After completing service, charge the cycle with specified amount of refrigerant.
(4) When performing service, install a filter drier simultaneously.
Be sure to use a filter drier for new refrigerant.

[2] Additional refrigerant charge

When charging directly from cylinder

· Check that cylinder for R410A on the market is syphon type.
· Charging should be performed with the cylinder of syphon stood vertically. (Refrigerant is charged from liquid phase.)



[3] Service tools

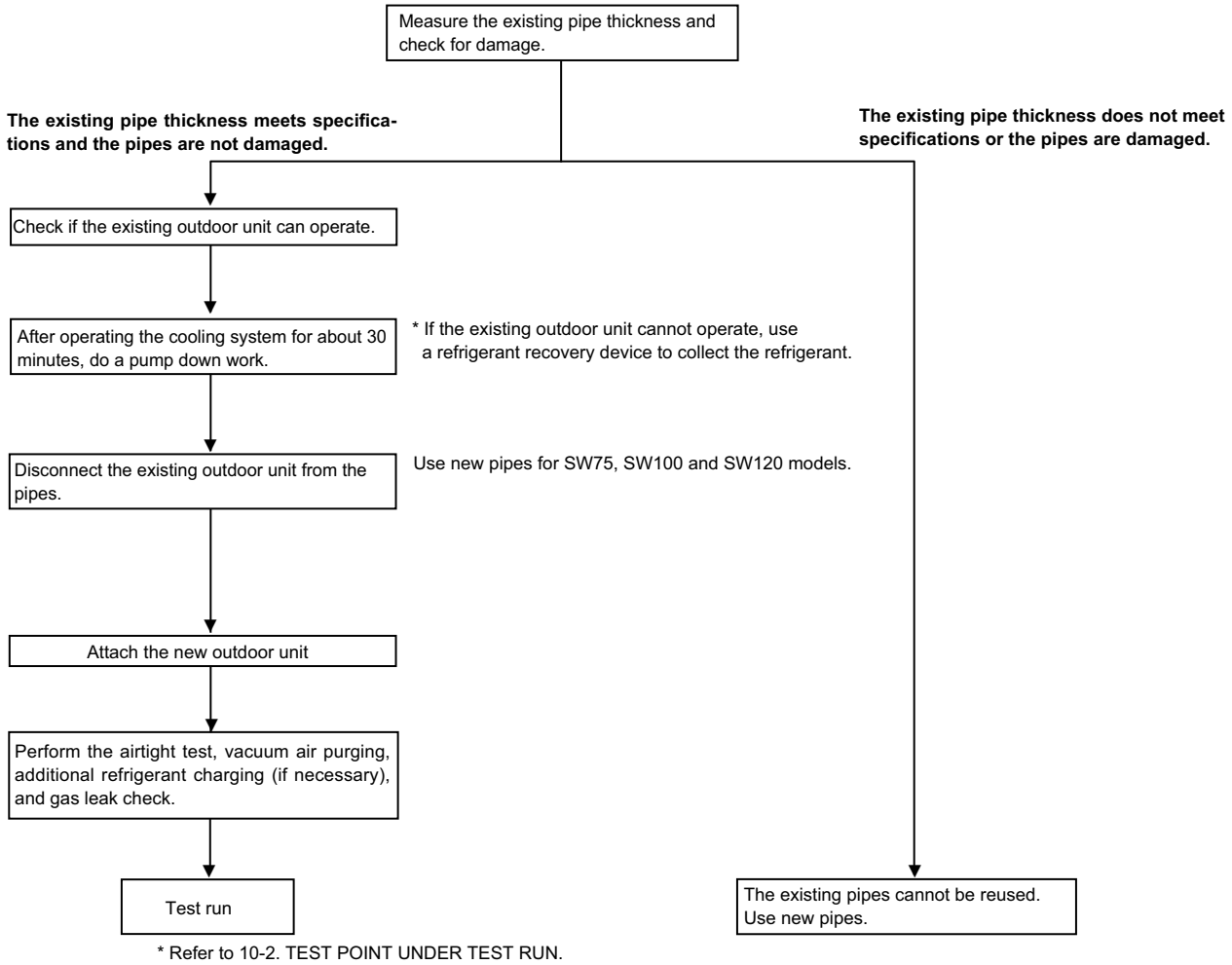
Use the below service tools as exclusive tools for R410A refrigerant.

No.	Tool name	Specifications
①	Gauge manifold	·Only for R410A
		·Use the existing fitting specifications. (UNF1/2)
		·Use high-tension side pressure of 5.3MPa·G or over.
②	Charge hose	·Only for R410A
		·Use pressure performance of 5.09MPa·G or over.
③	Electronic scale	——
④	Gas leak detector	·Use the detector for R134a, R407C or R410A.
⑤	Adaptor for reverse flow check	·Attach on vacuum pump.
⑥	Refrigerant charge base	——
⑦	Refrigerant cylinder	·Only for R410A ·Top of cylinder (Pink) ·Cylinder with syphon
⑧	Refrigerant recovery equipment	——

2-3. PRECAUTIONS WHEN REUSING EXISTING R22 REFRIGERANT PIPES

Flowchart

• Refer to the flowchart below to determine if the existing pipes can be used and if it is necessary to use a filter dryer.
• If the diameter of the existing pipes is different from the specified diameter, refer to technological data materials to confirm if the pipes can be used.


Measure the existing pipe thickness and check for damage.
The existing pipe thickness meets specifications and the pipes are not damaged.
The existing pipe thickness does not meet specifications or the pipes are damaged.
Check if the existing outdoor unit can operate.
After operating the cooling system for about 30 minutes, do a pump down work.
* If the existing outdoor unit cannot operate, use a refrigerant recovery device to collect the refrigerant.
Disconnect the existing outdoor unit from the pipes.
Use new pipes for SW75, SW100 and SW120 models.
Attach the new outdoor unit
Perform the airtight test, vacuum air purging, additional refrigerant charging (if necessary), and gas leak check.
Test run
The existing pipes cannot be reused. Use new pipes.

* Refer to 10-2. TEST POINT UNDER TEST RUN.

2-4. PRECAUTIONS FOR SALT PROOF TYPE "-BS" MODEL

Although "-BS" model has been designed to be resistant to salt damage, observe the following precautions to maintain the performance of the unit.

1. Avoid installing the unit in a location where it will be exposed directly to seawater or sea breeze.
2. If the cover panel may become covered with salt, be sure to install the unit in a location where the salt will be washed away by rainwater. (If a sunshade is installed, rainwater may not clean the panel.)
3. To ensure that water does not collect in the base of the outdoor unit, make sure that the base is level, not at angle. Water collecting in the base of the outdoor unit could cause rust.
4. If the unit is installed in a coastal area, clean the unit with water regularly to remove any salt build-up.
5. If the unit is damaged during installation or maintenance, be sure to repair it.
6. Be sure to check the condition of the unit regularly.
7. Be sure to install the unit in a location with good drainage.

Cautions for refrigerant piping work

New refrigerant R410A is adopted for replacement inverter series. Although the refrigerant piping work for R410A is same as for R22, exclusive tools are necessary so as not to mix with different kind of refrigerant. Furthermore as the working pressure of R410A is 1.6 times higher than that of R22, their sizes of flared sections and flare nuts are different.

① Thickness of pipes

Because the working pressure of R410A is higher compared to R22, be sure to use refrigerant piping with thickness shown below. (Never use pipes of 0.7mm or below.)

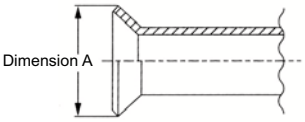
Diagram below: Piping diameter and thickness

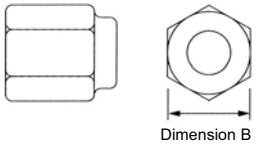
Nominal dimensions(inch)	Outside diameter (mm)	Thickness (mm)	
		R410A	R22
1/4	6.35	0.8	0.8
3/8	9.52	0.8	0.8
1/2	12.70	0.8	0.8
5/8	15.88	1.0	1.0
3/4	19.05	—	1.0

② Dimensions of flare cutting and flare nut

The component molecules in HFC refrigerant are smaller compared to conventional refrigerants. In addition to that, R410A is a refrigerant, which has higher risk of leakage because its working pressure is higher than that of other refrigerants. Therefore, to enhance airtightness and intensity, flare cutting dimension of copper pipe for R410A has been specified separately from the dimensions for other refrigerants as shown below. The dimension B of flare nut for R410A also has partly been changed to increase intensity as shown below. Set copper pipe correctly referring to copper pipe flaring dimensions for R410A below. For 1/2 and 5/8 inch, the dimension B changes.

Use torque wrench corresponding to each dimension.





Flare cutting dimensions (mm)

Nominal dimensions(inch)	Outside diameter	Dimension A ($^{+0}_{-0.4}$)	
		R410A	R22
1/4	6.35	9.1	9.0
3/8	9.52	13.2	13.0
1/2	12.70	16.6	16.2
5/8	15.88	19.7	19.4
3/4	19.05	—	23.3

Flare nut dimensions (mm)

Nominal dimensions(inch)	Outside diameter	Dimension B	
		R410A	R22
1/4	6.35	17.0	17.0
3/8	9.52	22.0	22.0
1/2	12.70	26.0	24.0
5/8	15.88	29.0	27.0
3/4	19.05	—	36.0

③ Tools for R410A (The following table shows whether conventional tools can be used or not.)

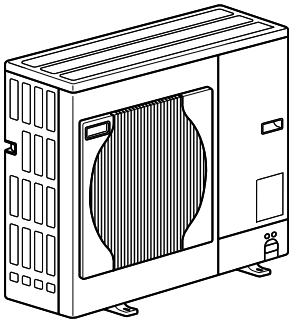
Tools and materials	Use	R410A tools	Can R22 tools be used?	Can R407C tools be used?
Gauge manifold	Air purge, refrigerant charge and operation check	Tool exclusive for R410A	×	×
Charge hose		Tool exclusive for R410A	×	×
Gas leak detector	Gas leak check	Tool for HFC refrigerant	×	○
Refrigerant recovery equipment	Refrigerant recovery	Tool exclusive for R410A	×	×
Refrigerant cylinder	Refrigerant charge	Tool exclusive for R410A	×	×
Applied oil	Apply to flared section	Ester oil and alkylbenzene oil (minimum amount)	×	Ester oil: ○ Alkylbenzene oil: minimum amount
Safety charger	Prevent compressor malfunction when charging refrigerant by spraying liquid refrigerant	Tool exclusive for R410A	×	×
Charge valve	Prevent gas from blowing out when detaching charge hose	Tool exclusive for R410A	×	×
Vacuum pump	Vacuum drying and air purge	Tools for other refrigerants can be used if equipped with adopter for reverse flow check	△ (Usable if equipped with adopter for reverse flow)	△ (Usable if equipped with adopter for reverse flow)
Flare tool	Flaring work of piping	Tools for other refrigerants can be used by adjusting flaring dimension	△ (Usable by adjusting flaring dimension)	△ (Usable by adjusting flaring dimension)
Bender	Bend the pipes	Tools for other refrigerants can be used	○	○
Pipe cutter	Cut the pipes	Tools for other refrigerants can be used	○	○
Welder and nitrogen gas cylinder	Weld the pipes	Tools for other refrigerants can be used	○	○
Refrigerant charging scale	Refrigerant charge	Tools for other refrigerants can be used	○	○
Vacuum gauge or thermistor vacuum gauge and vacuum valve	Check the degree of vacuum. (Vacuum valve prevents back flow of oil and refrigerant to thermistor vacuum gauge)	Tools for other refrigerants can be used	○	○
Charging cylinder	Refrigerant charge	Tool exclusive for R410A	×	—

× : Prepare a new tool. (Use the new tool as the tool exclusive for R410A.)

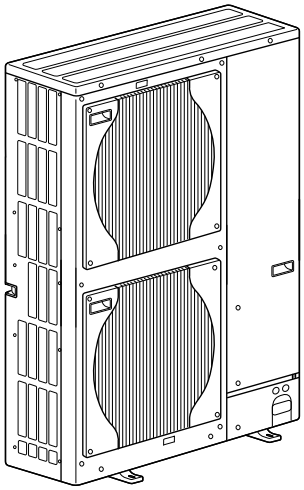
△ : Tools for other refrigerants can be used under certain conditions.

○ : Tools for other refrigerants can be used.

3 FEATURES



PUHZ-SW75VHA.UK
PUHZ-SW75VHA-BS.UK



PUHZ-SW100VHA.UK
PUHZ-SW100VHA-BS.UK
PUHZ-SW100YHA.UK
PUHZ-SW100YHA-BS.UK
PUHZ-SW120VHA.UK
PUHZ-SW120VHA-BS.UK
PUHZ-SW120YHA.UK
PUHZ-SW120YHA-BS.UK

CHARGELESS SYSTEM
PRE-CHARGED REFRIGERANT IS SUPPLIED FOR PIPING LENGTH AT SHIPMENT.
(Max. 10m (PUHZ-SW75-120))

The refrigerant circuit with LEV (Linear Expansion Valve) and Accumulator always control the optimal refrigerant level regardless of the length (10m max. and 5m min.) of piping. The additional refrigerant charging work during installation often causes problems. Heretofore it is completely eliminated. This unique system improves the quality and reliability of the work done. It also helps to speed up the installation time.

4 SPECIFICATIONS

<Reference data> Plate heat exchanger (ACH70-40 plates)

(SW75)

Nominal water flow		L/min	22.9
Heating (A7/W35)	Capacity	kW	8.00
	COP		4.40
	Power input	kW	1.82
Heating (A7/W45)	Capacity	kW	8.00
	COP		3.40
	Power input	kW	2.35
Heating (A2/W35)	Capacity	kW	7.50
	COP		3.40
	Power input	kW	2.20
Heating (A2/W45)	Capacity	kW	7.50
	COP		2.83
	Power input	kW	2.65
Nominal water flow		L/min	18.9
Cooling (A35/W7)	Capacity	kW	6.60
	EER		2.55
	Power input	kW	2.59
Cooling (A35/W18)	Capacity	kW	7.10
	EER		4.01
	Power input	kW	1.77

(SW120)

Nominal water flow		L/min	45.9
Heating (A7/W35)	Capacity	kW	16.0
	COP		4.10
	Power input	kW	3.90
Heating (A7/W45)	Capacity	kW	16.0
	COP		3.23
	Power input	kW	4.95
Heating (A2/W35)	Capacity	kW	12.0
	COP		3.24
	Power input	kW	3.70
Heating (A2/W45)	Capacity	kW	12.0
	COP		2.52
	Power input	kW	4.76
Nominal water flow		L/min	35.8
Cooling (A35/W7)	Capacity	kW	12.5
	EER		2.32
	Power input	kW	5.38
Cooling (A35/W18)	Capacity	kW	14.0
	EER		4.08
	Power input	kW	3.43

(SW100)

Nominal water flow		L/min	32.1
Heating (A7/W35)	Capacity	kW	11.2
	COP		4.45
	Power input	kW	2.51
Heating (A7/W45)	Capacity	kW	11.2
	COP		3.42
	Power input	kW	3.27
Heating (A2/W35)	Capacity	kW	10.0
	COP		3.32
	Power input	kW	3.02
Heating (A2/W45)	Capacity	kW	10.0
	COP		2.66
	Power input	kW	3.76
Nominal water flow		L/min	26.1
Cooling (A35/W7)	Capacity	kW	9.10
	EER		2.75
	Power input	kW	3.31
Cooling (A35/W18)	Capacity	kW	10.0
	EER		4.35
	Power input	kW	2.30

Note: "COP" and "Power input" in the above table are values that does **NOT** contains the "pump input (based on EN 14511)".

Rating conditions

Nominal operating condition	
Heating (A7/W35)	
Outside air temperature (Dry-bulb)	+ 7 °C
Outside air temperature (Wet-bulb)	+ 6 °C
Water temperature (inlet/outlet)	+ 30 °C/+ 35 °C
Heating (A7/W45)	
Outside air temperature (Dry-bulb)	+ 7 °C
Outside air temperature (Wet-bulb)	+ 6 °C
Water temperature (inlet/outlet)	+ 40 °C/+ 45 °C
Heating (A2/W35)	
Outside air temperature (Dry-bulb)	+ 2 °C
Outside air temperature (Wet-bulb)	+ 1 °C
Water temperature (inlet/outlet)	+ 30 °C/+ 35 °C
Heating (A2/W45)	
Outside air temperature (Dry-bulb)	+ 2 °C
Outside air temperature (Wet-bulb)	+ 1 °C
Water temperature (inlet/outlet)	+ 40 °C/+ 45 °C
Cooling (A35/W7)	
Outside air temperature (Dry-bulb)	+ 35 °C
Outside air temperature (Wet-bulb)	+ 24 °C
Water temperature (inlet/outlet)	+ 12 °C/+ 7 °C
Cooling (A35/W18)	
Outside air temperature (Dry-bulb)	+ 35 °C
Outside air temperature (Wet-bulb)	+ 24 °C
Water temperature (inlet/outlet)	+ 23 °C/+ 18 °C

Service Ref.				PUHZ-SW75VHA.UK PUHZ-SW75VHA-BS.UK
OUTDOOR UNIT	Power supply (phase, cycle, voltage)			Single, 50Hz, 230V
		Max. current	A	19
	External finish			Munsell 3Y 7.8/1.1
	Refrigerant control			Linear Expansion Valve
	Compressor			Hermetic
		Model		TNB220FLHMT
		Motor output	kW	1.3
		Starter type		Inverter
		Protection devices		HP switch Comp. surface thermo Discharge thermo Over current detection
	Crankcase heater		W	—
	Heat exchanger			Plate fin coil
	Fan	Fan(drive) × No.	kW	Propeller fan × 1
		Fan motor output	m³/min(CFM)	0.074
		Airflow		55(1,940)
	Defrost method			Reverse cycle
	Noise level	Cooling	dB	48
		Heating	dB	51
	Dimensions	W	mm(in.)	950(37-3/8)
		D	mm(in.)	330+30(13+1-3/16)
		H	mm(in.)	943(37-1/8)
	Weight		kg(lbs)	75(165)
	Refrigerant			R410A
		Charge	kg(lbs)	3.2(7.0)
		Oil (Model)	L	0.87(FV50S)
REFRIGERANT PIPING	Pipe size O.D.	Liquid	mm(in.)	9.52(3/8)
		Gas	mm(in.)	15.88(5/8)
	Connection method	Indoor side		Flared
		Outdoor side		Flared
	Between the indoor & outdoor unit	Height difference		Max. 10m
		Piping length		Max. 40m

Service Ref.				PUHZ-SW100VHA.UK PUHZ-SW100VHA-BS.UK	PUHZ-SW120VHA.UK PUHZ-SW120VHA-BS.UK
OUTDOOR UNIT	Power supply (phase, cycle, voltage)			Single 50Hz, 230V	
		Max. current	A	29.5	
	External finish			Munsell 3Y 7.8/1.1	
	Refrigerant control			Linear Expansion Valve	
	Compressor			Hermetic	
		Model		ANB33FNEMT	ANB42FNEMT
		Motor output	kW	2.5	2.5
		Starter type		Inverter	
		Protection devices		HP switch LP switch Discharge thermo Comp. surface thermo Over current detection	
	Crankcase heater		W	—	
	Heat exchanger			Plate fin coil	
	Fan	Fan(drive) × No.		Propeller fan × 2	
		Fan motor output	kW	0.060+0.060	
		Airflow	m³/min(CFM)	100(3,530)	
	Defrost method			Reverse cycle	
	Noise level	Cooling	dB	50	51
		Heating	dB	54	54
	Dimensions	W	mm(in.)	950(37-3/8)	
		D	mm(in.)	330+30(13+1-3/16)	
		H	mm(in.)	1,350(53-1/8)	
	Weight		kg(lbs)	118(260)	
	Refrigerant			R410A	
		Charge	kg(lbs)	4.6(10.1)	
		Oil (Model)	L	1.40(FV50S)	
REFRIGERANT PIPING	Pipe size O.D.	Liquid	mm(in.)	9.52(3/8)	
		Gas	mm(in.)	15.88(5/8)	
	Connection method	Indoor side		Flared	
		Outdoor side		Flared	
	Between the indoor & outdoor unit	Height difference		Max. 30m	
		Piping length		Max. 75m	

Service Ref.				PUHZ-SW100YHA.UK PUHZ-SW100YHA-BS.UK	PUHZ-SW120YHA PUHZ-SW120YHA-BS.UK
OUTDOOR UNIT	Power supply (phase, cycle, voltage)			3 phase, 50Hz, 400V	
	Max. current		A	13	
	External finish			Munsell 3Y 7.8/1.1	
	Refrigerant control			Linear Expansion Valve	
	Compressor			Hermetic	
	Model			ANB33FNDMT	ANB42FNDMT
	Motor output		kW	2.5	2.5
	Starter type			Inverter	
	Protection devices			HP switch LP switch Discharge thermo Comp.surface thermo Over current detection	
	Crankcase heater		W	—	
	Heat exchanger			Plate fin coil	
	Fan	Fan(drive) × No.		Propeller fan × 2	
		Fan motor output	kW	0.060+0.060	
		Airflow	m³/min(CFM)	100(3,530)	
	Defrost method			Reverse cycle	
	Noise level	Cooling	dB	49	50
		Heating	dB	51	52
	Dimensions	W	mm(in.)	950(37-3/8)	
		D	mm(in.)	330+30(13+1-3/16)	
		H	mm(in.)	1,350(53-1/8)	
	Weight		kg(lbs)	130(287)	
	Refrigerant			R410A	
		Charge	kg(lbs)	4.6(10.1)	
		Oil (Model)	L	1.40(FV50S)	
REFRIGERANT PIPING	Pipe size O.D.	Liquid	mm(in.)	9.52(3/8)	
		Gas	mm(in.)	15.88(5/8)	
	Connection method	Indoor side		Flared	
		Outdoor side		Flared	
	Between the indoor & outdoor unit	Height difference		Max. 30m	
		Piping length		Max. 75m	

5 DATA

5-1. REFILLING REFRIGERANT CHARGE (R410A : kg)

Service Ref.	Piping length (one way)							Initial charged
	10m	20m	30m	40m	50m	60m	75m	
PUHZ-SW75VHA.UK PUHZ-SW75VHA-BS.UK	3.2	3.6	4.0	4.6	—	—	—	3.2
PUHZ-SW100VHA.UK PUHZ-SW100VHA-BS.UK PUHZ-SW100YHA.UK PUHZ-SW100YHA-BS.UK	4.6	4.8	5.0	5.6	6.2	6.8	7.5	4.6
PUHZ-SW120VHA.UK PUHZ-SW120VHA-BS.UK PUHZ-SW120YHA.UK PUHZ-SW120YHA-BS.UK	4.6	4.8	5.0	5.6	6.2	6.8	7.5	4.6

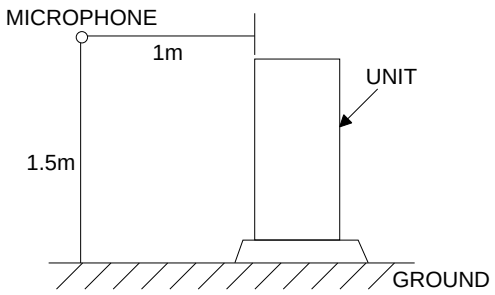
Additional charge is required for pipes longer than 10 m.

5-2. COMPRESSOR TECHNICAL DATA

(at 20°C)

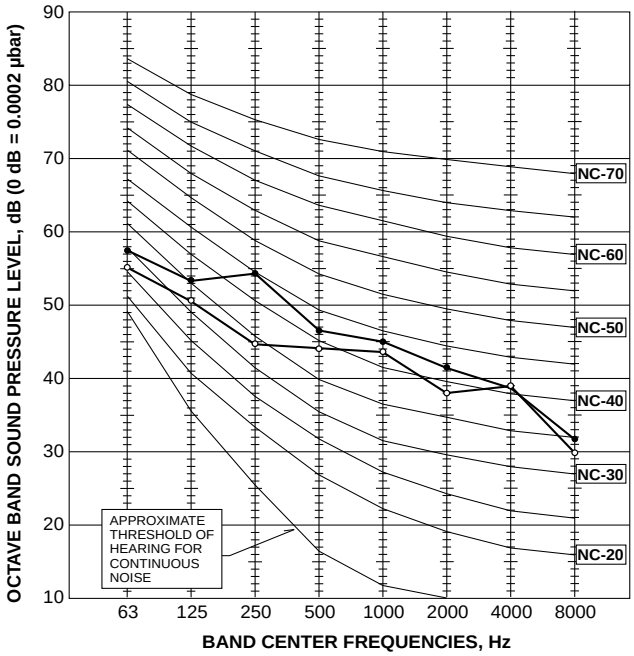
Service Ref.		PUHZ-SW75VHA.UK PUHZ-SW75VHA-BS.UK	PUHZ-SW100VHA.UK PUHZ-SW100VHA-BS.UK	PUHZ-SW120VHA.UK PUHZ-SW120VHA-BS.UK	PUHZ-SW100YHA.UK PUHZ-SW100YHA-BS.UK	PUHZ-SW120YHA.UK PUHZ-SW120YHA-BS.UK
Compressor model		TNB220FLHMT	ANB33FNEMT	ANB42FNEMT	ANB33FNDMT	ANB42FNDMT
Winding Resistance (Ω)	U-V	0.88	0.19	0.19	0.30	0.30
	U-W	0.88	0.19	0.19	0.30	0.30
	W-V	0.88	0.19	0.19	0.30	0.30

5-3. NOISE CRITERION CURVES



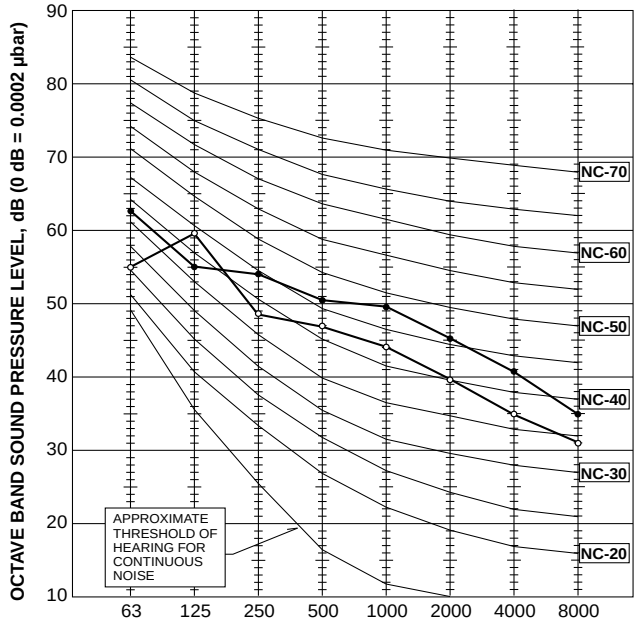
PUHZ-SW75VHA.UK
PUHZ-SW75VHA-BS.UK

MODE	SPL(dB)	LINE
COOLING	48	○—○
HEATING	51	●—●



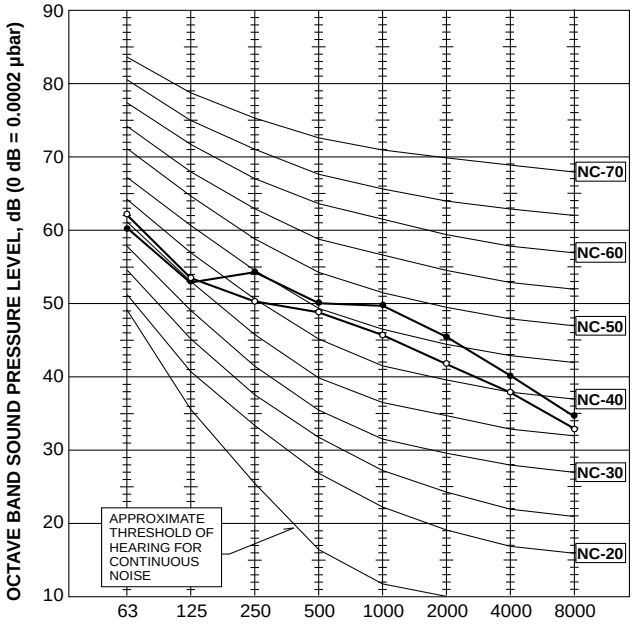
PUHZ-SW100VHA.UK
PUHZ-SW100VHA-BS.UK
PUHZ-SW100YHA.UK
PUHZ-SW100YHA-BS.UK

MODE	SPL(dB)	LINE
COOLING	50	○—○
HEATING	54	●—●



PUHZ-SW120VHA.UK
PUHZ-SW120VHA-BS.UK
PUHZ-SW120YHA.UK
PUHZ-SW120YHA-BS.UK

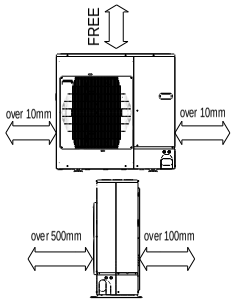
MODE	SPL(dB)	LINE
COOLING	51	○—○
HEATING	54	●—●



PUHZ-SW75VHA.UK
PUHZ-SW75VHA-BS.UK

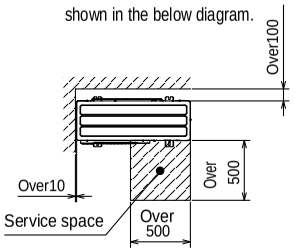
1 FREE SPACE (Around the unit)

The diagram below shows a basic example.
Explanation of particular details is given in the installation manuals etc.



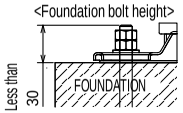
2 SERVICE SPACE

Dimensions of space needed for service access are shown in the below diagram.



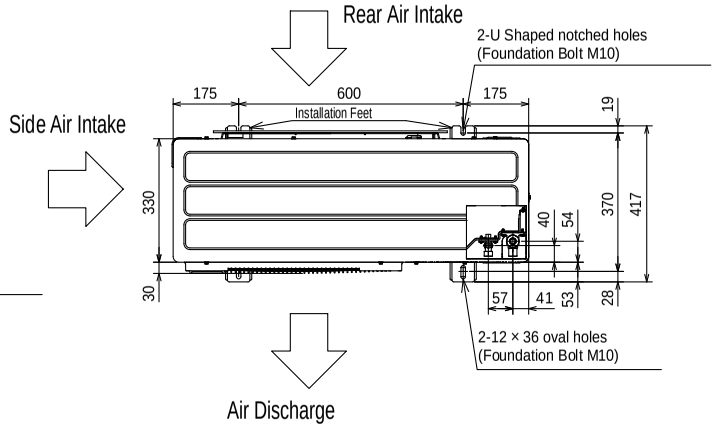
3 FOUNDATION BOLTS

Please secure the unit firmly with 4 foundation (M10) bolts. (Bolts and washers must be purchased locally.)



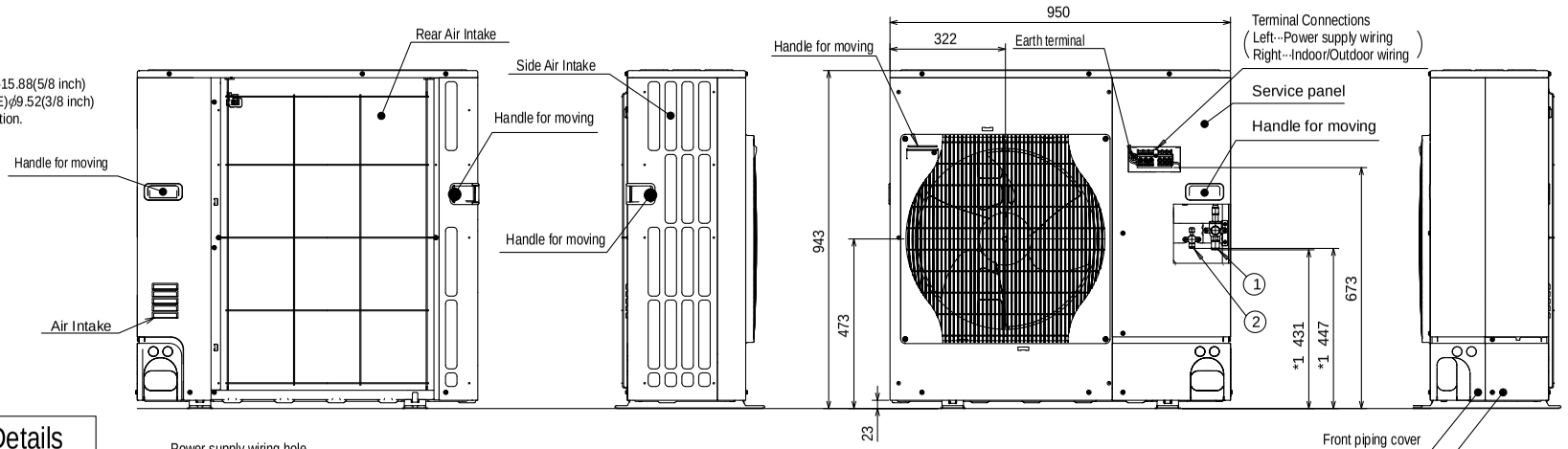
4 PIPING-WIRING DIRECTIONS

Piping and wiring connections can be made from 4 directions: front, right, rear and below.

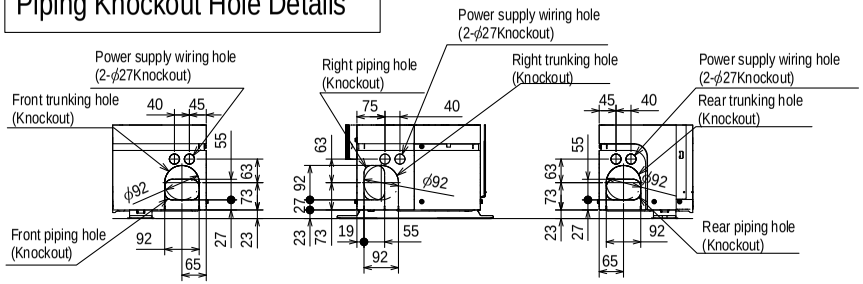


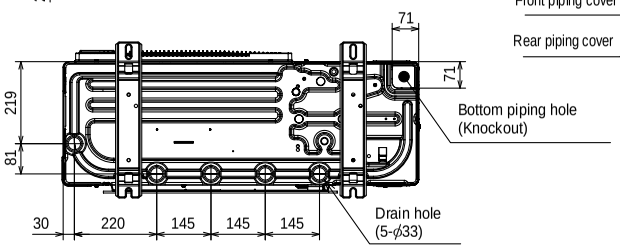
Example of Notes

① Refrigerant GAS pipe connection (FLARE)ϕ15.88(5/8 inch)
② Refrigerant LIQUID pipe connection (FLARE)ϕ9.52(3/8 inch)
*1...Indication of STOP VALVE connection location.



Piping Knockout Hole Details

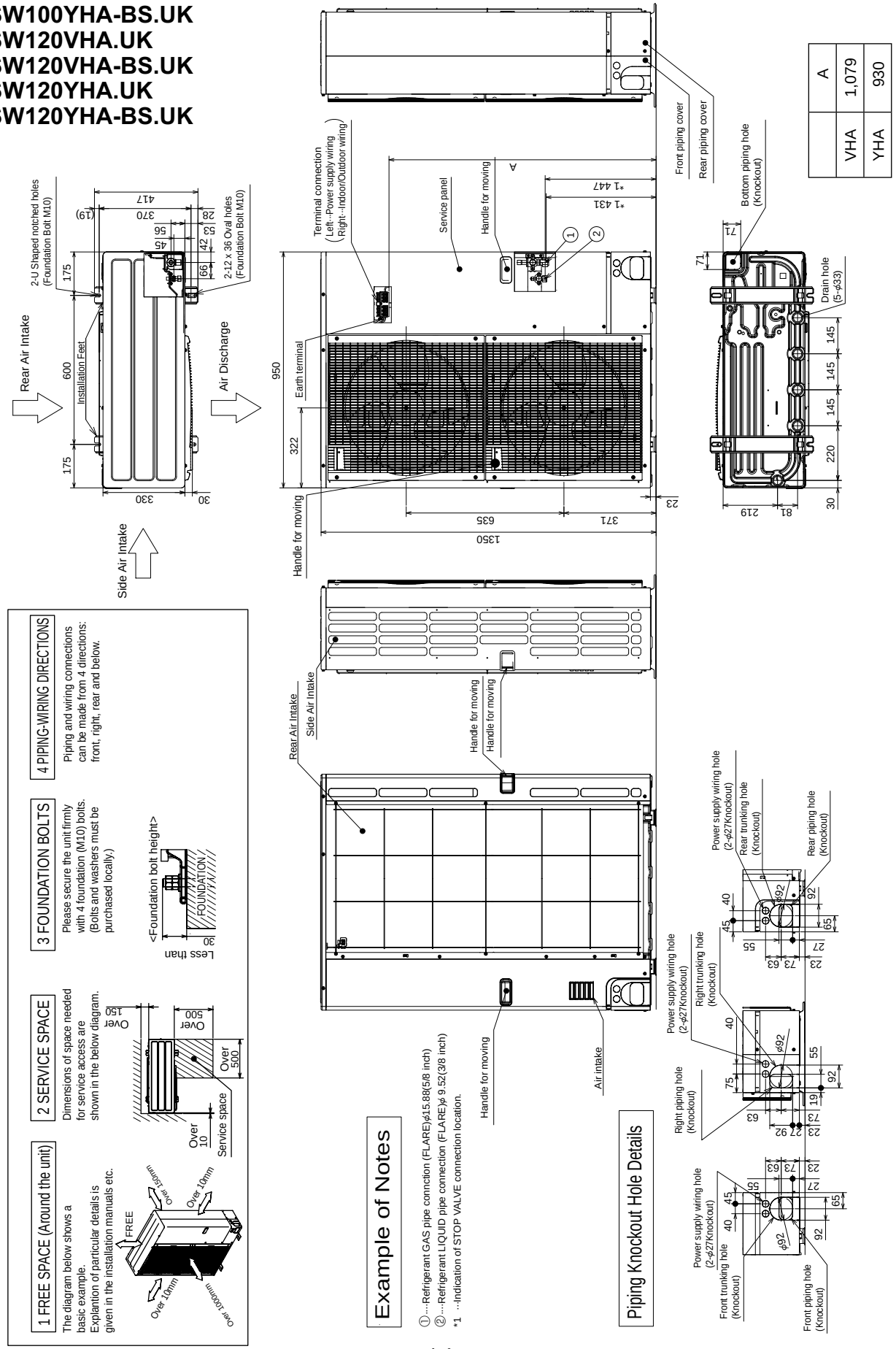




Unit : mm

PUHZ-SW100VHA.UK
PUHZ-SW100VHA-BS.UK
PUHZ-SW100YHA.UK
PUHZ-SW100YHA-BS.UK
PUHZ-SW120VHA.UK
PUHZ-SW120VHA-BS.UK
PUHZ-SW120YHA.UK
PUHZ-SW120YHA-BS.UK

Unit : mm

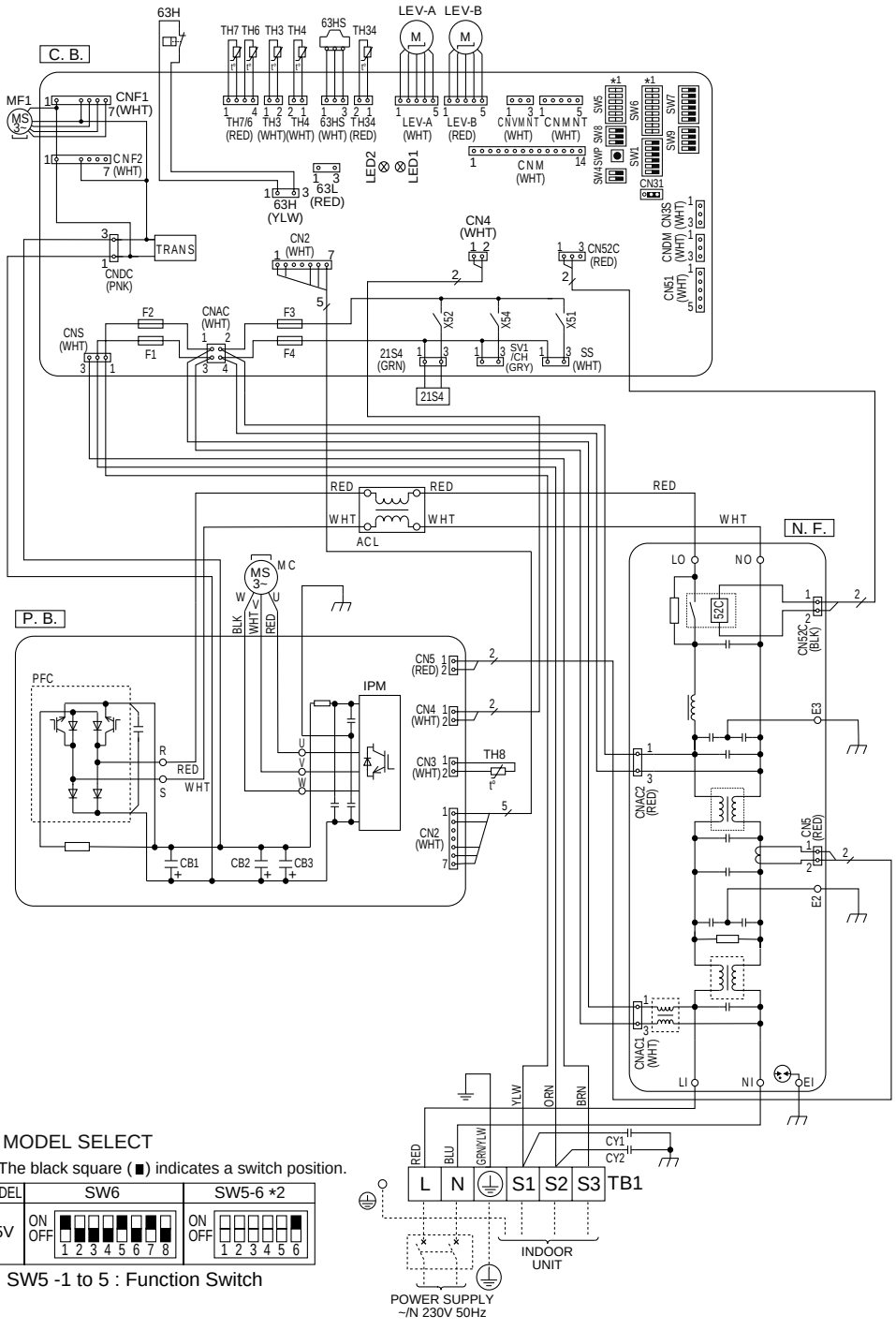

Rear Air Intake
Side Air Intake
Air Discharge
2-U Shaped notched holes (Foundation Bolt M10)
2-12 x 36 Oval holes (Foundation Bolt M10)
Installation Feet
Terminal connection (Left···Power supply wiring Right···Indoor/Outdoor wiring)
Service panel
Handle for moving
Front piping cover
Rear piping cover
Bottom piping hole (Knockout)
Drain hole (5-φ33)
Earth terminal
Air intake
Power supply wiring hole (2-φ27Knockout)
Rear trunking hole (Knockout)
Rear piping hole (Knockout)
Right trunking hole (Knockout)
Right piping hole (Knockout)
Front trunking hole (Knockout)
Front piping hole (Knockout)
1 FREE SPACE (Around the unit)
The diagram below shows a basic example. Explantion of particular details is given in the installation manuals etc.
2 SERVICE SPACE
Dimensions of space needed for service access are shown in the below diagram.
Service space
3 FOUNDATION BOLTS
Please secure the unit firmly with 4 foundation (M10) bolts. (Bolts and washers must be purchased locally.)
<Foundation bolt height>
4 PIPING-WIRING DIRECTIONS
Piping and wiring connections can be made from 4 directions: front, right, rear and below.
Example of Notes
① ···Refrigerant GAS pipe connction (FLARE)φ15.88(5/8 inch)
② ···Refrigerant LIQUID pipe connection (FLARE)φ 9.52(3/8 inch)
*1 ···Indication of STOP VALVE connection location.
Piping Knockout Hole Details

	A
VHA	1,079
YHA	930

7 WIRING DIAGRAM

PUHZ-SW75VHA.UK
PUHZ-SW75VHA-BS.UK

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
TB1	Terminal Block <Power Supply, Indoor/Outdoor>	P.B.	Power Circuit Board	SW5	Switch <Function Switch, Model Select>
MC	Motor for Compressor	R, S	Connection Terminal <L/N-Phase>	SW6	Switch <Model Select>
MF1	Fan Motor	U, V, W	Connection Terminal <U/V/W-Phase>	SW7	Switch <Function Switch>
21S4	Solenoid Valve (Four-Way Valve)	IPM	Power Module	SW8	Switch <Function Switch>
63H	High Pressure Switch	PFC	Converter	SW9	Switch <Function Switch>
63HS	High Pressure Sensor	CB1, CB2, CB3	Main Smoothing Capacitor	SWP	Switch <Pump Down>
TH3	Thermistor <Liquid>	N.F.	Noise Filter Circuit Board	CN31	Connector <Emergency Operation>
TH4	Thermistor <Discharge>	LI, LO	Connection Terminal <L-Phase>	CNDM	Connector <Connection for Option>
TH6	Thermistor <2-Phase Pipe>	NI, NO	Connection Terminal <N-Phase>	CN51	Connector <Connection for Option>
TH7	Thermistor <Ambient>	EI, E2, E3	Connection Terminal <Ground>	SV1/CH	Connector <Connection for Option>
TH8	Thermistor <Heat Sink>	52C	52C Relay	SS	Connector <Connection for Option>
TH34	Thermistor <Comp. Surface>	C.B.	Controller Circuit Board	CNM	Connector <Connection for Option>
LEV-A, LEV-B	Linear Expansion Valve	SW1	Switch <Manual Defrost, Defect History, Record Reset, Refrigerant Address>	LED1, LED2	LED <Operation Inspection Indicators>
ACL	Reactor			F1, F2, F3, F4	Fuse <T6.3AL250V>
CY1, CY2	Capacitor	SW4	Switch <Test Operation>	X51, X52, X54	Relay



⋆1 MODEL SELECT

The black square (■) indicates a switch position.

MODEL	SW6	SW5-6 ⋆2
75V	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6

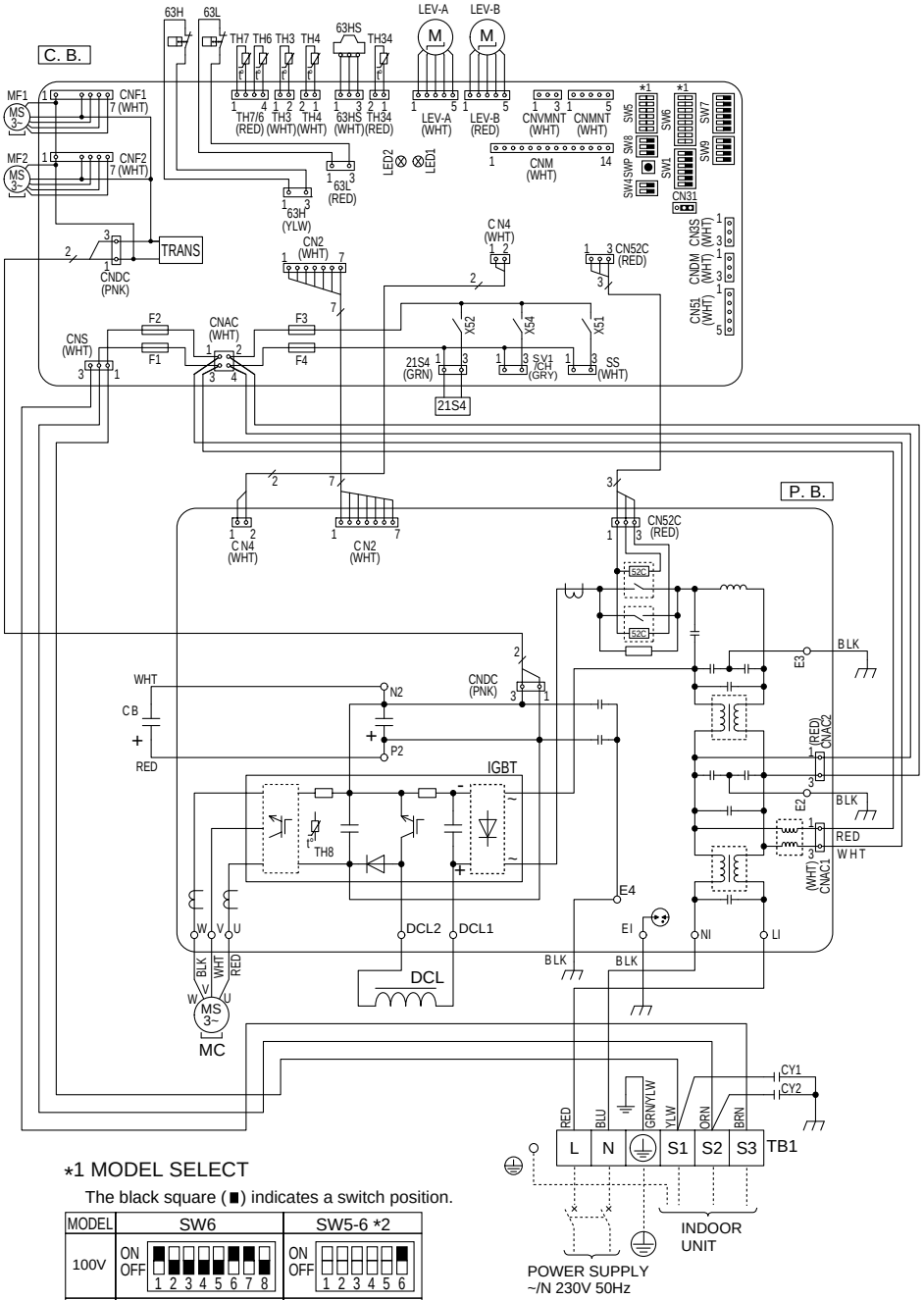
⋆2 SW5 -1 to 5 : Function Switch

PUHZ-SW100VHA.UK PUHZ-SW120VHA.UK
PUHZ-SW100VHA-BS.UK PUHZ-SW120VHA-BS.UK

SYMBOL	NAME
TB1	Terminal Block <Power Supply, Indoor/Outdoor>
MC	Motor for Compressor
MF1, MF2	Fan Motor
21S4	Solenoid Valve (Four-Way Valve)
63H	High Pressure Switch
63L	Low Pressure Switch
63HS	High Pressure Sensor
TH3	Thermistor <Liquid>
TH4	Thermistor <Discharge>
TH6	Thermistor <2-Phase Pipe>
TH7	Thermistor <Ambient>
TH8	Thermistor (internal) <Heat Sink>
TH34	Thermistor <Comp. Surface>
LEV-A, LEV-B	Linear Expansion Valve
DCL	Reactor
CB	Main Smoothing Capacitor
CY1, CY2	Capacitor

SYMBOL	NAME
P. B.	Power Circuit Board
U, V, W	Connection Terminal <U/V/W-Phase>
LI	Connection Terminal <L-Phase>
NI	Connection Terminal <N-Phase>
P2	Connection Terminal
N2	Connection Terminal
DCL1, DCL2	Connection Terminal <Reactor>
IGBT	Power Module
EI, E2, E3, E4	Connection Terminal <Ground>
52C	52C Relay
C. B.	Controller Circuit Board
SW1	Switch <Manual Defrost, Defect History, Record Reset, Refrigerant Address>
SW4	Switch <Test Operation>
SW5	Switch <Function Switch, Model Select>
SW6	Switch <Model Select>

SYMBOL	NAME
SW7	Switch <Function Switch>
SW8	Switch <Function Switch>
SW9	Switch <Function Switch>
SWP	Switch <Pump Down>
CN31	Connector <Emergency Operation>
CNDM	Connector <Connection for Option>
CN51	Connector <Connection for Option>
SV1/CH	Connector <Connection for Option>
SS	Connector <Connection for Option>
CNM	Connector <Connection for Option>
LED1, LED2	LED <Operation Inspection Indicators>
F1, F2, F3, F4	Fuse <T6.3AL250V>
X51, X52, X54	Relay



*1 MODEL SELECT

The black square (■) indicates a switch position.

MODEL	SW6	SW5-6 *2
100V	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6
120V	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6

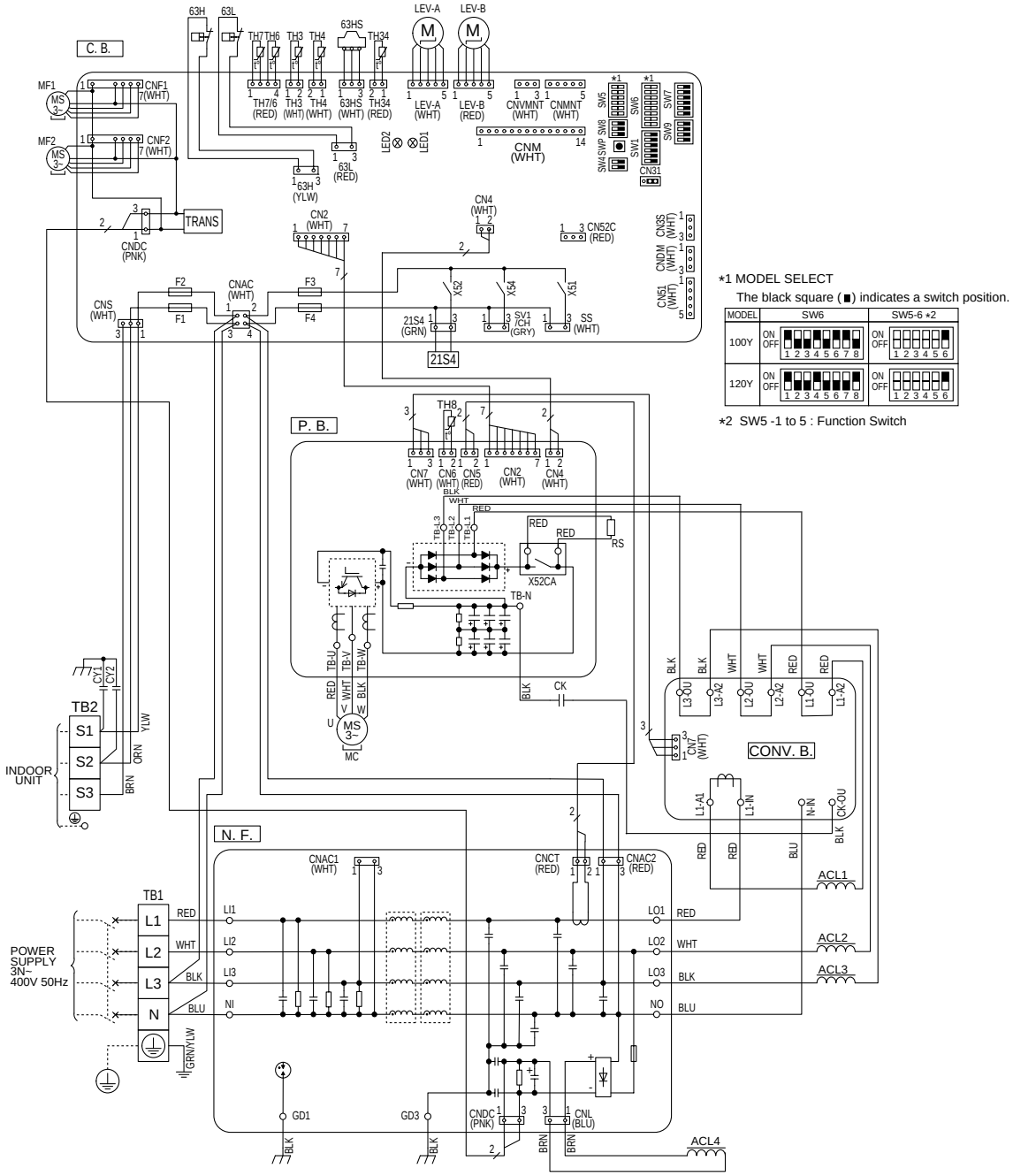
*2 SW5 -1 to 5 : Function Switch

PUHZ-SW100YHA.UK PUHZ-SW120YHA.UK
PUHZ-SW100YHA-BS.UK PUHZ-SW120YHA-BS.UK

SYMBOL	NAME
TB1	Terminal Block <Power Supply>
TB2	Terminal Block <Indoor/Outdoor>
MC	Motor for Compressor
MF1, MF2	Fan Motor
21S4	Solenoid Valve (Four-Way Valve)
63H	High Pressure Switch
63L	Low Pressure Switch
63HS	High Pressure Sensor
TH3	Thermistor <Liquid>
TH4	Thermistor <Discharge>
TH6	Thermistor <2-Phase Pipe>
TH7	Thermistor <Ambient>
TH8	Thermistor <Heat Sink>
TH34	Thermistor <Comp. Surface>
LEV-A, LEV-B	Linear Expansion Valve
ACL1, ACL2, ACL3, ACL4	Reactor
CY1, CY2	Capacitor
CK	Capacitor
RS	Rush Current Protect Resistor

SYMBOL	NAME
P. B.	Power Circuit Board
TB-U/V/W	Connection Terminal <U/V/W-Phase>
TB-L1/L2/L3	Connection Terminal <L1/L2/L3-Power Supply>
TB-N	Connection Terminal
X52CA	52C Relay
N. F.	Noise Filter Circuit Board
LI1/LI2/LI3/NI	Connection Terminal <L1/L2/L3/N-Power Supply>
LO1/LO2/LO3/NO	Connection Terminal <L1/L2/L3/N-Power Supply>
GD1, GD3	Connection Terminal <Ground>
CONV. B.	Converter Circuit Board
L1-A1/IN	Connection Terminal <L1-Power Supply>
L1-A2/OU	Connection Terminal <L1-Power Supply>
L2-A2/OU	Connection Terminal <L2-Power Supply>
L3-A2/OU	Connection Terminal <L3-Power Supply>
N-IN	Connection Terminal
CK-OU	Connection Terminal

SYMBOL	NAME
C. B.	Controller Circuit Board
SW1	Switch <Manual Defrost, Defect History, Record Reset, Refrigerant Address>
SW4	Switch <Test Operation>
SW5	Switch <Function Switch, Model Select>
SW6	Switch <Model Select>
SW7	Switch <Function Switch>
SW8	Switch <Function Switch>
SW9	Switch <Function Switch>
SWP	Switch <Pump Down>
CN31	Connector <Emergency Operation>
CNDM	Connector <Connection for Option>
CN51	Connector <Connection for Option>
SV1/CH	Connector <Connection for Option>
SS	Connector <Connection for Option>
CNM	Connector <Connection for Option>
LED1, LED2	LED <Operation Inspection Indicators>
F1, F2, F3, F4	FUSE <T6.3AL250V>
X51, X52, X54	Relay



MODEL	SW6	SW5-6 *2
100Y	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6
120Y	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6

8 WIRING SPECIFICATIONS

FIELD ELECTRICAL WIRING (power wiring specifications)

Outdoor unit model			SW75V	SW100V	SW120V	SW100, 120Y
Outdoor unit power supply			~/N (single), 50 Hz, 230 V	~/N (single), 50 Hz, 230 V	~/N (single), 50 Hz, 230 V	3N~ (3 ph 4-wires), 50 Hz, 400 V
Outdoor unit input capacity Main switch (Breaker)		*1	25 A	32 A	40 A	16 A
Wiring Wire No. × size (mm^2)	Outdoor unit power supply		3 × Min. 2.5	3 × Min. 4	3 × Min. 6	5 × Min. 1.5
	Indoor unit-Outdoor unit	*2	3 × 1.5 (Polar)	3 × 1.5 (Polar)	3 × 1.5 (Polar)	3 × 1.5 (Polar)
	Indoor unit-Outdoor unit earth	*2	1 × Min. 1.5	1 × Min. 1.5	1 × Min. 1.5	1 × Min. 1.5
	Remote controller-Indoor unit	*3	2 × 0.3 (Non-polar)	2 × 0.3 (Non-polar)	2 × 0.3 (Non-polar)	2 × 0.3 (Non-polar)
Circuit rating	Outdoor unit L-N (single) Outdoor unit L1-N, L2-N, L3-N (3 phase)	*4	AC 230 V	AC 230 V	AC 230 V	AC 230 V
	Indoor unit-Outdoor unit S1-S2	*4	AC 230 V	AC 230 V	AC 230 V	AC 230 V
	Indoor unit-Outdoor unit S2-S3	*4	DC 24 V	DC 24 V	DC 24 V	DC 24 V
	Remote controller-Indoor unit	*4	DC 12 V	DC 12 V	DC 12 V	DC 12 V

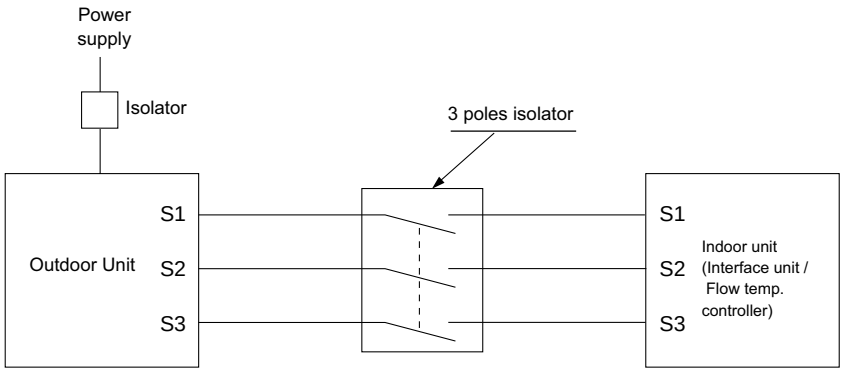
*1. A breaker with at least 3.0 mm contact separation in each poles shall be provided. Use earth leakage breaker (NV).
Make sure that the current leakage breaker is one compatible with higher harmonics.
Always use a current leakage breaker that is compatible with higher harmonics as this unit is equipped with an inverter.
The use of an inadequate breaker can cause the incorrect operation of inverter.

*2. Max. 45 m
If 2.5 mm^2 used, Max. 50 m
If 2.5 mm^2 used and S3 separated, Max. 80 m

*3. The 10 m wire is attached in the remote controller accessory.

*4. The figures are NOT always against the ground.
S3 terminal has DC 24 V against S2 terminal. However between S3 and S1, these terminals are NOT electrically insulated by the transformer or other device.

Notes: 1. Wiring size must comply with the applicable local and national codes.
2. Power supply cables and the cables between Interface unit/Flow temp. controller and outdoor unit shall not be lighter than polychloroprene sheathed flexible cables. (Design 60245 IEC 57)
3. Be sure to connect the cables between Interface unit/Flow temp. controller and outdoor unit directly to the units (no intermediate connections are allowed).
Intermediate connections may result in communication errors. If water enters at the intermediate connection point, it may cause insufficient insulation to ground or a poor electrical contact .
(If an intermediate connection is necessary, be sure to take measures to prevent water from entering the cables.)
4. Install an earth longer than other cables.
5. Do not construct a system with a power supply that is turned ON and OFF frequently.



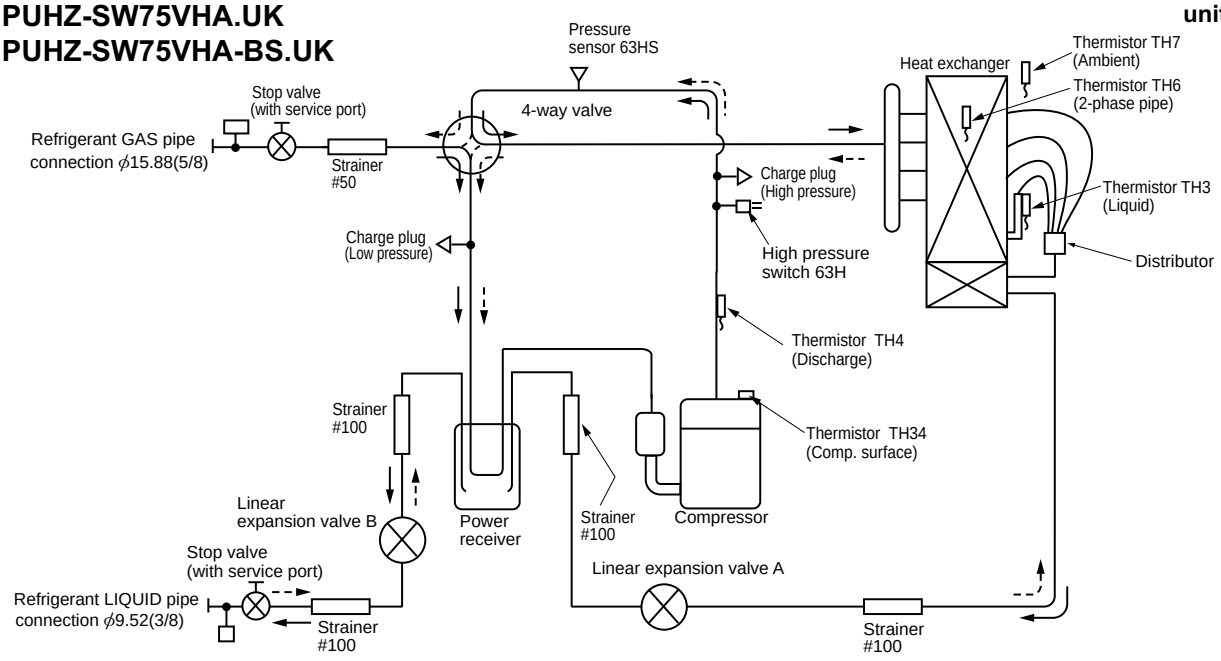
⚠ **Warning:**
· In case of A-control wiring, there is high voltage potential on the S3 terminal caused by electrical circuit design that has no electrical insulation between power line and communication signal line. Therefore, please turn off the main power supply when servicing. And do not touch the S1, S2, S3 terminals when the power is energized. If isolator should be used between indoor unit and outdoor unit, please use 3-pole type.

Never splice the power cable or the indoor-outdoor connection cable, otherwise it may result in a smoke, a fire or communication failure.

9 REFRIGERANT SYSTEM DIAGRAM

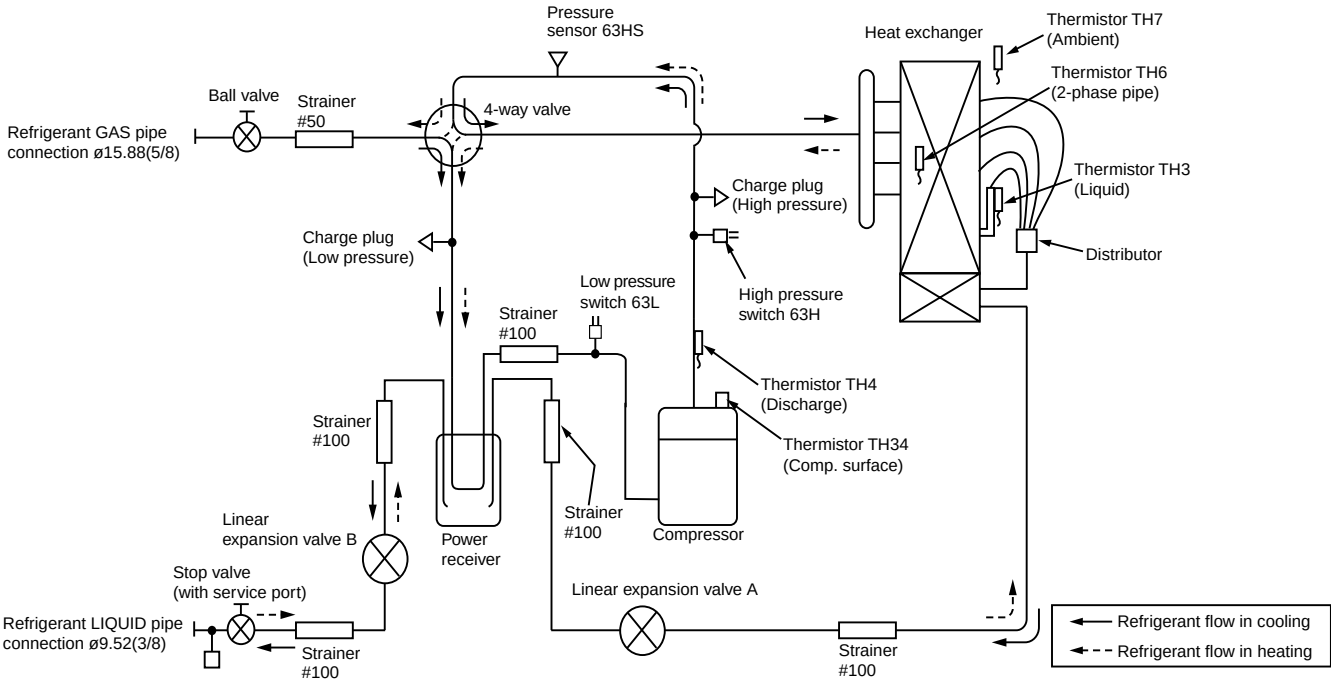
PUHZ-SW75VHA.UK
PUHZ-SW75VHA-BS.UK

unit : mm(inch)



PUHZ-SW100VHA
PUHZ-SW100VHA-BS
PUHZ-SW100YHA
PUHZ-SW100YHA-BS

PUHZ-SW120VHA
PUHZ-SW120VHA-BS
PUHZ-SW120YHA
PUHZ-SW120YHA-BS



Symbol	Part name	Detail
COMP	Compressor	DC inverter twin rotary compressor (Mitsubishi Electric Corporation)
H/P SW	High pressure switch (63H)	For protection (OFF:4.15MPa)
L/P SW	Low pressure switch (63L)	For protection (OFF:-0.03MPa) (SW100/120)
REV/V	Reversing (4-way) valve (21S4)	Change the refrigerant circuit (Heating / Cooling) and for Defrosting
Charge plug	Charge plug	High pressure / Low pressure / For production test use
P-Sensor	Pressure sensor (63HS)	For calculation of the condensing temperature from high pressure
LEV-A	Linear expansion valve -A	Heating:Secondary LEV Cooling:Primary LEV
LEV-B	Linear expansion valve -B	Heating:Primary LEV Cooling:Secondary LEV
TH3	Liquid temperature thermistor	Heating:Evaporating temperature Cooling:Sub cool liquid temperature
TH4	Discharge temperature thermistor	For LEV control and for compressor protection
TH6	2-phase pipe temperature thermistor	Outdoor 2-phase pipe temperature
TH7	Ambient temperature thermistor	For fan control and for compressor frequency control
TH34	Comp.surface temperature thermistor	For compressor protection
Power Receiver	Power Receiver	For accumulation of refrigerant

9-1. Refrigerant collecting (pump down)

Perform the following procedures to collect the refrigerant when moving the indoor unit or the outdoor unit.

① Supply power (circuit breaker).
  * When power is supplied, make sure that “CENTRALLY CONTROLLED” is not displayed on the remote controller. If “CENTRALLY CONTROLLED” is displayed, the refrigerant collecting (pump down) cannot be completed normally.
  * Start-up of the indoor-outdoor communication takes about 3 minutes after the power (circuit breaker) is turned on. Start the pump-down operation 3 to 4 minutes after the power (circuit breaker) is turned ON.
  * In the case of multi-units control, before powering on, disconnect the wiring between the master indoor unit and the slave indoor unit. For more details refer to the installation manual for the indoor unit.

② After the liquid stop valve is closed, set the SWP switch on the control board of the outdoor unit to ON. The compressor (outdoor unit) and ventilators (indoor and outdoor units) start operating and refrigerant collecting operation begins. LED1 and LED2 on the control board of the outdoor unit are lit.
  * Only set the SWP switch (push-button type) to ON if the unit is stopped. However, even if the unit is stopped and the SWP switch is set to ON less than 3 minutes after the compressor stops, the refrigerant collecting operation cannot be performed. Wait until compressor has been stopped for 3 minutes and then set the SWP switch to ON again.

③ Because the unit automatically stops in about 2 to 3 minutes when the refrigerant collecting operation is completed (LED1 off, LED2 lit), be sure to quickly close the gas stop valve. If LED1 is lit and LED2 is off and the outdoor unit is stopped, refrigerant collection is not properly performed. Open the liquid stop valve completely, and then repeat step ② after 3 minutes have passed.
  * If the refrigerant collecting operation has been completed normally (LED1 off, LED2 lit), the unit will remain stopped until the power supply is turned off.

④ Turn off the power supply (circuit breaker).
  * Note that when the extension piping is very long with large refrigerant amount, it may not be possible to perform a pump-down operation. When performing the pump-down operation, make sure that the low pressure is lowered to near 0 MPa (gauge).

⚠ **Warning:**
When pumping down the refrigerant, stop the compressor before disconnecting the refrigerant pipes. The compressor may burst if air etc. get into it.

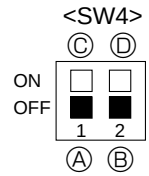
9-2. Unit replacement operation

When reusing the existing pipes that carried R22 refrigerant for the SW75/100/120 models, replacement operation must be performed before performing a test run.

① If new pipes are used, these procedures are not necessary.
② If existing pipes that carried R22 refrigerant are used for the SW75/100/120 models, these procedures are not necessary. (The replacement operation cannot be performed.)
③ During replacement operation, “C5” is displayed on “A-Control Service Tool (PAC-SK52ST)”. (This is applied to only SW75/100/120 models.)

9-3. Start and finish of test run

- Operation from the indoor unit
  Execute the test run using the installation manual for the indoor unit.
- Operation from the outdoor unit
  By using the DIP switch SW4 on the control board of outdoor unit, test run can be started and finished, and its operation mode (cooling/heating) can be set up.
  ① Set the operation mode (cooling/heating) using SW4-2.
  ② Turn on SW4-1 to start test run with the operation mode set by SW4-2.
  ③ Turn off SW4-1 to finish the test run.
- There may be a faint knocking sound around the machine room after power is supplied, but this is no problem with product because the linear expansion pipe is just moving to adjust opening pulse.
- There may be a knocking sound around the machine room for several seconds after compressor starts operating, but this is no problem with product because the check valve itself, generates the sound because pressure difference is small in the refrigerant circuit.



Ⓐ Stop Ⓒ Operation
Ⓑ Cooling Ⓓ Heating

Note:
The operation mode cannot be changed by SW4-2 during test run. (To change test run mode, stop the unit by SW4-1, change the operation mode and restart the test run by SW4-1.)

10 TROUBLESHOOTING

10-1. TROUBLESHOOTING

<Error code display by self-diagnosis and actions to be taken for service (summary)>
Present and past error codes are logged and displayed on the control board of outdoor unit. Actions to be taken for service, which depends on whether or not the trouble is reoccurring at service, are summarized in the table below. Check the contents below before investigating details.

Unit conditions at service	Error code	Actions to be taken for service (summary)
The trouble is reoccurring.	Displayed	Judge what is wrong and take a corrective action according to "10-3. Self-diagnosis action table".
	Not displayed	Conduct troubleshooting and ascertain the cause of the trouble.
The trouble is not reoccurring.	Logged	① Consider the temporary defects such as the work of protection devices in the refrigerant circuit including compressor, poor connection of wiring, noise and etc. Re-check the symptom, and check the installation environment, refrigerant amount, weather when the trouble occurred, matters related to wiring and etc. ② Reset error code logs and restart the unit after finishing service. ③ There is no abnormality in electrical component, controller board, and etc.
	Not logged	① Re-check the abnormal symptom. ② Conduct troubleshooting and ascertain the cause of the trouble. ③ Continue to operate unit for the time being if the cause is not ascertained. ④ There is no abnormality concerning of parts such as electrical component, controller board, and etc.

10-2. CHECK POINT UNDER TEST RUN

Before test run
- After installation of outdoor unit, piping work and electric wiring work, re-check that there is no water leakage, loosened connections and incorrect polarity.
- Measure impedance between the ground and the power supply terminal block (L, N) on the outdoor unit by 500 V Megger and check that it is 1.0 MΩ or over.
- Turn on power supply 12 hours before test run in order to protect compressor.
- Make sure to read operation manual before test run. (Especially items to secure safety.)

10-3. SELF-DIAGNOSIS ACTION TABLE

<Abnormalities detected when the power is turned on> Note: Refer to indoor unit section for code P and code E.

Error Code	Abnormal point and detection method	Case	Judgment and action
None	—	① No voltage is supplied to terminal block (TB1) of outdoor unit. a) Power supply breaker is turned off. b) Contact failure or disconnection of power supply terminal c) Open phase (L or N phase)	① Check following items. a) Power supply breaker b) Connection of power supply terminal block (TB1) c) Connection of power supply terminal block (TB1)
		② Electric power is not charged to power supply terminal of outdoor power circuit board. a) Contact failure of power supply terminal b) Open phase on the outdoor power circuit board SW75VHA : Disconnection of connector R or S SW100/120VHA : Disconnection of connector LI or NI	② Check following items. a) Connection of power supply terminal block (TB1) b) Connection of terminal on outdoor power circuit board SW75VHA: Check connection of the connector R or S. Refer to 10-7. SW100/120VHA : Check connection of the connector LI or NI. Refer to 10-7.
		③ Electric power is not supplied to outdoor controller circuit board. a) Disconnection of connector (CNDC)	③ Check connection of the connector (CNDC) on the outdoor controller circuit board. Check connection of the connector, CNDC on the outdoor power circuit board(V)/the noise filter(Y). Refer to 10-7.
		④ Disconnection of reactor (DCL or ACL)	④ Check connection of reactor. (DCL or ACL) SW75VHA : Check connection of “LO” and “NO” on the outdoor noise filter circuit board. Check connection of "R" and "S" on the outdoor power circuit board. Refer to 10-7. SW100/120VHA : Check connection of "DCL1" and "DCL2" on the outdoor power circuit board. Refer to 10-7.
		⑤ Disconnection of outdoor noise filter circuit board or parts failure in outdoor noise filter circuit board As for SW75VHA, it is especially needed to check the resistance RS on the noise filter circuit board.	⑤ a) Check connection of outdoor noise filter circuit board. b) Replace outdoor noise filter circuit board. Refer to 10-7.
		⑥ Defective outdoor power circuit board	⑥ Replace outdoor power circuit board.
		⑦ Defective outdoor controller circuit board	⑦ Replace controller board (When items above are checked but the units can not be repaired).
F3	**63L connector open (SW100/120 only)** Abnormal if 63L connector circuit is open for 3 minutes continuously after power supply. 63L: Low-pressure switch	① Disconnection or contact failure of 63L connector on outdoor controller circuit board	① Check connection of 63L connector on outdoor controller circuit board. Refer to 10-7.
		② Disconnection or contact failure of 63L	② Check the 63L side of connecting wire.
		③ 63L is working due to refrigerant leakage or defective parts.	③ Check refrigerant pressure. Charge additional refrigerant. Check continuity by tester. Replace the parts if the parts are defective.
		④ Defective outdoor controller circuit board	④ Replace outdoor controller circuit board.
F5	**63H connector open** Abnormal if 63H connector circuit is open for 3 minutes continuously after power supply. 63H: High-pressure switch	① Disconnection or contact failure of 63H connector on outdoor controller circuit board	① Check connection of 63H connector on outdoor controller circuit board. Refer to 10-7.
		② Disconnection or contact failure of 63H	② Check the 63H side of connecting wire.
		③ 63H is working due to defective parts.	③ Check continuity by tester. Replace the parts if the parts are defective.
		④ Defective outdoor controller circuit board	④ Replace outdoor controller circuit board.

Error Code	Abnormal point and detection method	Case	Judgment and action
F9	**2 connector open (SW100/120 only)** Abnormal if both 63H and 63L connector circuits are open for three minutes continuously after power supply. 63H: High-pressure switch 63L: Low-pressure switch	① Disconnection or contact failure of connector (63H,63L) on outdoor controller circuit board. ② Disconnection or contact failure of 63H, 63L ③ 63H and 63L are working due to defective parts. ④ Defective outdoor controller board.	① Check connection of connector (63H,63L) on outdoor controller circuit board. Refer to 10-7. ② Check the 63H and 63L side of connecting wire. ③ Check continuity by tester. Replace the parts if the parts are defective. ④ Replace outdoor controller circuit board.
EA	**Indoor/outdoor unit connector miswiring, excessive number of units (4 units or more)** 1. Outdoor controller circuit board can automatically check the number of connected indoor units. Abnormal if the number cannot be checked automatically due to miswiring of indoor/outdoor unit connecting wire and etc. after power is turned on for 4 minutes. 2. Abnormal if outdoor controller circuit board recognizes the number of connected indoor units as “4 units or more”.	① Contact failure or miswiring of indoor/outdoor unit connecting wire ② Diameter or length of indoor/outdoor unit connecting wire is out of specified capacity. ③ 4 or more indoor units are connected to one outdoor unit. ④ Defective transmitting receiving circuit of outdoor controller circuit board ⑤ Defective transmitting receiving circuit of indoor controller board ⑥ Defective indoor power board ⑦ 2 or more outdoor units have refrigerant address “0” . (In case of group control) ⑧ Noise has entered into power supply or indoor / outdoor unit connecting wire.	① Check disconnection or looseness or polarity of indoor/outdoor unit connecting wire of indoor and outdoor units. ② Check diameter and length of indoor/outdoor unit connecting wire. Total wiring length: 80m (including wiring connecting each indoor unit and between indoor and outdoor unit) Also check if the connection order of flat cable is S1, S2, S3. ③ Check the number of indoor units that are connected to one outdoor unit. (If EA is detected) ④~⑥ Turn the power off once, and on again to check. Replace outdoor controller circuit board, indoor controller board or indoor power board if abnormality occurs again. ⑦ Check if refrigerant addresses (SW1-3 to SW1-6 on outdoor controller circuit board) are overlapping in case of group control system. ⑧ Check transmission path, and remove the cause. * The descriptions above, ①-⑧, are for EA, Eb and EC.
Eb	**Miswiring of indoor/outdoor unit connecting wire (converse wiring or disconnection)** Outdoor controller circuit board can automatically set the unit number of indoor units. Abnormal if the indoor unit number can not be set within 4 minutes after power on because of miswiring (converse wiring or disconnection) of indoor/outdoor unit connecting wire.	① Contact failure or miswiring of indoor/outdoor unit connecting wire ② Diameter or length of indoor/outdoor unit connecting wire is out of specified capacity. ④ Defective transmitting receiving circuit of outdoor controller circuit board ⑤ Defective transmitting receiving circuit of indoor controller board ⑥ Defective indoor power board ⑦ 2 or more outdoor units have refrigerant address “0” . (In case of group control) ⑧ Noise has entered into power supply or indoor/outdoor unit connecting wire.	
EC	**Start-up time over** The unit cannot finish start-up process within 4 minutes after power on.	① Contact failure of indoor/outdoor unit connecting wire ② Diameter or length of indoor/outdoor unit connecting wire is out of specified capacity. ⑦ 2 or more outdoor units have refrigerant address “0” . (In case of group control) ⑧ Noise has entered into power supply or indoor/outdoor unit connecting wire.	
EE	**Incorrect connection** The outdoor unit does not receive the signals of I/F or FTC.	① A device other than Interface unit or Flow temp. controller unit is connected to the unit.	① Connect I/F or FTC to the unit.

<Abnormalities detected while unit is operating>

Error Code	Abnormal point and detection method	Case	Judgment and action
U1	**High pressure (High-pressure switch 63H operated)** Abnormal if high-pressure switch 63H operated (*) during compressor operation. * 4.15 MPa 63H: High-pressure switch	① Short cycle of indoor unit ② Clogged filter of indoor unit ③ Decreased airflow caused by dirt of indoor fan ④ Dirt of indoor heat exchanger ⑤ Locked indoor fan motor ⑥ Malfunction of indoor fan motor ⑦ Defective operation of stop valve (Not fully open) ⑧ Clogged or broken pipe ⑨ Locked outdoor fan motor ⑩ Malfunction of outdoor fan motor ⑪ Short cycle of outdoor unit ⑫ Dirt of outdoor heat exchanger ⑬ Decreased airflow caused by defective inspection of outside temperature thermistor (It detects lower temperature than actual temperature.) ⑭ Disconnection or contact failure of connector (63H) on outdoor controller board ⑮ Disconnection or contact failure of 63H connection ⑯ Defective outdoor controller board ⑰ Defective action of linear expansion valve ⑱ Malfunction of fan driving circuit	①~⑥Check indoor unit and repair defect. ⑦ Check if stop valve is fully open. ⑧ Check piping and repair defect. ⑨~⑫ Check outdoor unit and repair defect. ⑬ Check the detected temperature of outside temperature thermistor on LED display. (SW2 on A-Control Service Tool : Refer to 10-8.) ⑭~⑯Turn the power off and check F5 is displayed when the power is turned again. When F5 is displayed, refer to “Judgment and action” for F5. ⑰ Check linear expansion valve. Refer to 10-5. ⑱ Replace outdoor controller board.
U2	**High discharging temperature** (1) Abnormal if discharge temperature thermistor (TH4) exceeds 125℃ or 110℃ continuously for 5 minutes. Abnormal if discharge temperature thermistor (TH4) exceeds 110℃ or more continuously for 30 seconds after 90 seconds have passed since the defrosting operation started. (2) Abnormal if discharge superheat (Cooling: TH4 – T_{63HS} / Heating: TH4 – T_{63HS}) exceeds 70℃ continuously for 10 minutes. **High comp. surface temperature** Abnormal if comp. surface temperature (TH34) exceeds 125℃.In the case of high comp. surface temperature error, compressor does not restart unless the thermistor (TH34) becomes less than 95℃.	① Overheated compressor operation caused by shortage of refrigerant ② Defective operation of stop valve ③ Defective thermistor ④ Defective outdoor controller board ⑤ Defective action of linear expansion valve ⑥ Clogging with foreign objects in refrigerant circuit ※ Clogging occur in the parts which become below freezing point when water enters in refrigerant circuit.	① Check intake superheat. Check leakage of refrigerant. Charge additional refrigerant. ② Check if stop valve is fully open. ③④ Turn the power off and check if U3 is displayed when the power is turned on again. When U3 is displayed, refer to “Judgement and action” for U3. ⑤ Check linear expansion valve. Refer to 10-5. ⑥ After recovering refrigerant, remove water from entire refrigerant circuit under vacuum more than 1 hour.
U3	**Open/short circuit of discharge temperature thermistor (TH4) / Comp. surface temperature thermistor (TH34)** Abnormal if open (3℃ or less) or short (217℃ or more) is detected during compressor operation. (Detection is inoperative for 10 minutes of compressor starting process and for 10 minutes after and during defrosting.)	① Disconnection or contact failure of connector (TH4/TH34) on the outdoor controller circuit board ② Defective thermistor ③ Defective outdoor controller circuit board	① Check connection of connector (TH4/TH34) on the outdoor controller circuit board. Check breaking of the lead wire for thermistor (TH4/TH34). Refer to 10-7. ② Check resistance value of thermistor (TH4/TH34) or temperature by microprocessor. (Thermistor/TH4/TH34: Refer to 10-5.) (SW2 on A-Control Service Tool: Refer to 10-8.) ③ Replace outdoor controller board.

Error Code	Abnormal point and detection method	Case	Judgment and action
U4	**Open/short of outdoor unit thermistors (TH3, TH6, TH7, and TH8)** Abnormal if open or short is detected during compressor operation. Open detection of thermistors TH3 and TH6 is inoperative for 10 seconds to 10 minutes after compressor starting and 10 minutes after and during defrosting. * Check which unit has abnormality in its thermistor by switching the mode of SW2. (PAC-SK52ST) (Refer to 10-8.) * SW100/120V Heatsink thermistor(TH8) is in the power module.	① Disconnection or contact failure of connectors (Outdoor controller circuit board: TH3, TH7/6 Outdoor power circuit board: CN3) ② Defective thermistor ③ Defective outdoor controller circuit board	① Check connection of connector (TH3, TH7/6) on the outdoor controller circuit board. Check connection of connector (CN3) on the outdoor power circuit board. Check breaking of the lead wire for thermistor (TH3, TH6,TH7,TH8). Refer to 10-7. ② Check resistance value of thermistor (TH3, TH6,TH7,TH8) or check temperature by microprocessor. (Thermistor/TH3,TH6,TH7,TH8: Refer to 10-5.) (SW2 on A-Control Service Tool: Refer to 10-8.) ③ Replace outdoor controller circuit board. * Emergency operation is available in case of abnormalities of TH3, TH6 and TH7.
U5	**Temperature of heatsink** Abnormal if heatsink thermistor (TH8) detects temperature indicated below. SW75V ····· 79°C SW100V ····· 94°C SW100Y ····· 84°C SW120V ····· 94°C SW120Y ····· 84°C	① The outdoor fan motor is locked. ② Failure of outdoor fan motor ③ Air flow path is clogged. ④ Rise of ambient temperature ⑤ Defective thermistor ⑥ Defective input circuit of outdoor power circuit board ⑦ Failure of outdoor fan drive circuit	①② Check outdoor fan. ③ Check air flow path for cooling. ④ Check if there is something which causes temperature rise around outdoor unit. (Upper limit of ambient temperature is 46℃.) Turn off power, and on again to check if U5 is displayed within 30 minutes. If U4 is displayed instead of U5, follow the action to be taken for U4. ⑤ Check resistance value of thermistor (TH8) or temperature by microprocessor. (Thermistor/TH8: Refer to 10-5.) (SW2 on A-Control Service Tool: Refer to 10-8.) ⑥ Replace outdoor power circuit board. ⑦ Replace outdoor controller circuit board.
U6	**Power module** Check abnormality by driving power module in case overcurrent is detected. (UF or UP error condition)	① Outdoor stop valve is closed. ② Decrease of power supply voltage ③ Looseness, disconnection or converse of compressor wiring connection ④ Defective compressor ⑤ Defective outdoor power circuit board	① Open stop valve. ② Check facility of power supply. ③ Correct the wiring (U·V·W phase) to compressor. Refer to 10-7 (Outdoor power circuit board). ④ Check compressor referring to 10-5. ⑤ Replace outdoor power circuit board.
U7	**Too low superheat due to low discharge temperature** Abnormal if discharge superheat is continuously detected less than or equal to -15℃ for 3 minutes even though linear expansion valve has minimum open pulse after compressor starts operating for 10 minutes.	① Disconnection or loose connection of discharge temperature thermistor (TH4) ② Defective holder of discharge temperature thermistor ③ Disconnection or loose connection of linear expansion valve's coil ④ Disconnection or loose connection of linear expansion valve's connector ⑤ Defective linear expansion valve	①② Check the installation conditions of discharge temperature thermistor (TH4). ③ Check the coil of linear expansion valve. Refer to 10-6. ④ Check the connection or contact of LEV-A and LEV-B on outdoor controller circuit board. ⑤ Check linear expansion valve. Refer to 10-5.
U8	**Outdoor fan motor** Abnormal if rotational frequency of the fan motor is not detected during DC fan motor operation. Fan motor rotational frequency is abnormal if; • 100 rpm or below detected continuously for 15 seconds at 20℃ or more outside air temperature. • 50 rpm or below or 1500 rpm or more detected continuously for 1 minute.	① Failure in the operation of the DC fan motor ② Failure in the outdoor circuit controller board	① Check or replace the DC fan motor. ② Check the voltage of the outdoor circuit controller board during operation. ③ Replace the outdoor circuit controller board. (When the failure is still indicated even after performing the action ① above.)

Thermistors		Open detection	Short detection
Symbol	Name		
TH3	Thermistor <Liquid>	- 40 °C or below	90 °C or above
TH6	Thermistor <2-phase pipe>	- 40 °C or below	90 °C or above
TH7	Thermistor <Amibient>	- 40 °C or below	90 °C or above
TH8	Thermistor <Heatsink> SW75VHA, SW100/120YHA	- 27 °C or below	102 °C or above
TH8	Internal thermistor SW100/120VHA	- 35 °C or below	170 °C or above

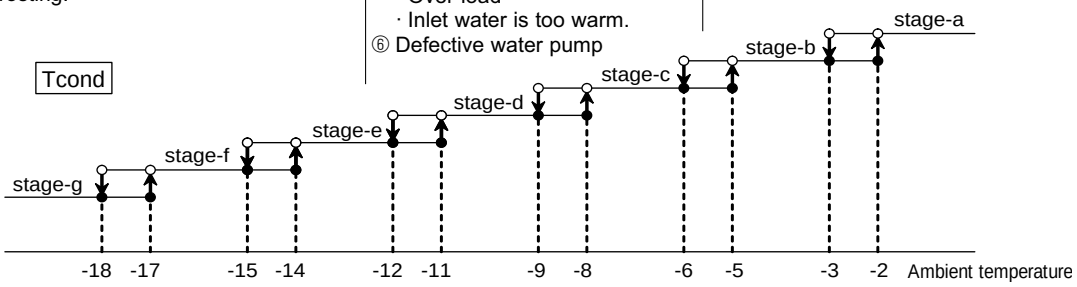
Error Code	Abnormal point and detection method		Case	Judgment and action
U9	Detailed codes	To find out the details about U9 error, turn ON SW2-1, 2-2, 2-3, 2-4, 2-5 and 2-6 when U9 error occurs. To find out the detail history (latest) about U9 error, turn ON SW2-1, 2-2 and 2-6. Refer to 10-8.		
	01	**Overvoltage error** • Increase in DC bus voltage to SW75VHA: 420V SW100, 120VHA: 400V SW100, 120YHA: 760V	① Abnormal increase in power source voltage ② Disconnection of compressor wiring ③ Defective outdoor power circuit board ④ Compressor has a ground fault.	① Check the field facility for the power supply. ② Correct the wiring (U·V·W phase) to compressor. Refer to 10-7 (Outdoor power circuit board). ③ Replace outdoor power circuit board. ④ Check compressor for electrical insulation. Replace compressor.
	02	**Undervoltage error** • Instantaneous decrease in DC bus voltage to SW75, 100, 120VHA: 200V SW100, 120YHA: 350V	① Decrease in power source voltage, instantaneous stop. ② Disconnection or loose connection of CN52C on the outdoor power circuit board/controller circuit board (SW100, 120VHA) ③ Disconnection or loose connection of CN52C on the outdoor noise filter circuit board/controller circuit board (SW75VHA) ④ Defective converter drive circuit in outdoor power circuit board (SW·VHA) ⑤ Defective 52C drive circuit in outdoor power circuit board (SW100, 120V/YHA) ⑥ Defective 52C drive circuit in outdoor noise filter circuit board (SW75) ⑦ Defective outdoor converter circuit board (SW·YHA) ⑧ Disconnection or loose connection of rush current protect resistor RS (SW·YHA) ⑨ Defective rush current protect resistor RS (SW·YHA) ⑩ Disconnection or loose connection of main smoothing capacitor CB (SW100,120VHA) ⑪ Disconnection or loose connection of CN2 on the outdoor power circuit board /controller circuit board (SW100,120VHA) ⑫ Power circuit failure on DC supply for 18V DC output on outdoor controller circuit board (SW100,120VHA).	① Check the field facility for the power supply. ②③ Check CN52C wiring. (SW·VHA) ④ Replace outdoor power circuit board. (SW·VHA) ⑤ Replace outdoor power circuit board. (SW100,120V/YHA) ⑥ Replace outdoor noise filter circuit board. (SW75VHA) ⑦ Replace outdoor converter circuit board. (SW·YHA) ⑧ Check RS wiring. (SW·YHA) ⑨ Replace RS. (SW·YHA) ⑩ Check CB wiring. (SW100,120VHA) ⑪ Check CN2 wiring. (SW100,120VHA) ⑫ Replace outdoor controller circuit board. (SW100,120VHA)
	04	**Input current sensor error/ L1-phase open error** • Decrease in input current through outdoor unit to 0.1A only if operation frequency is more than or equal to 40Hz or compressor current is more than or equal to 6A.	① L1-phase open (SW·YHA) ② Disconnection or loose connection between TB1 and outdoor noise filter circuit board (SW75VHA/SW100, 120YHA) ③ Disconnection or loose connection of CN5 on the outdoor power circuit board/ CNCT on the outdoor noise filter board (SW75VHA/SW100, 120YHA) ④ Defective ACCT (AC current trans) on the outdoor noise filter circuit board (SW75VHA/SW100, 120YHA) ⑤ Defective input current detection circuit in outdoor power circuit board ⑥ Defective outdoor controller circuit board	① Check the field facility for the power supply. (SW·YHA) ② Check the wiring between TB1 and outdoor noise filter circuit board. (SW75VHA/SW100, 120YHA) ③ Check CN5/CNCT wiring. (SW75VHA/ SW100, 120YHA) ④ Replace outdoor noise filter circuit board. (SW·YHA) ⑤ Replace outdoor power circuit board. ⑥ Replace outdoor controller circuit board.
	08	**Abnormal power synchronous signal** • No input of power synchronous signal to power circuit board • Power synchronous signal of 44 Hz or less, or 65 Hz or more is detected on power circuit board.	① Distortion of power source voltage, Noise superimposition. ② Disconnection or loose connection of earth wiring ③ Disconnection or loose connection of CN2 on the outdoor power circuit board /controller circuit board ④ Defective power synchronous signal circuit in outdoor controller circuit board ⑤ Defective power synchronous signal circuit in outdoor power circuit board	① Check the field facility for the power supply. ② Check earth wiring. ③ Check CN2 wiring. ④ Replace outdoor controller circuit board. ⑤ Replace outdoor power circuit board.

Error Code	Abnormal point and detection method		Case	Judgment and action
U9	Detailed codes: 10	**PFC error (Overvoltage/ Undervoltage/Overcurrent)** • PFC detected any of the followings a) Increase of DC bus voltage to 420V. b) Decrease in PFC control voltage to 12V DC or lower c) Increase in input current to 50A peak (SW75VHA only)	① Abnormal increase in power source voltage ② Decrease in power source voltage, instantaneous stop ③ Disconnection of compressor wiring ④ Misconnection of reactor (ACL) ⑤ Defective outdoor power circuit board ⑥ Defective reactor (ACL) ⑦ Disconnection or loose connection of CN2 on the outdoor power circuit board/ controller circuit board	①② Check the field facility for the power supply. ③ Correct the wiring (U·V·W phase) to compressor. Refer to 10-7 (Outdoor power circuit board). ④ Correct the wiring of reactor (ACL). ⑤ Replace outdoor power circuit board. ⑥ Replace reactor (ACL). ⑦ Check CN2 wiring.
	20	**PFC/IGBT error (Undervoltage)** • When Compressor is running, DC bus voltage stays at 310V or lower for consecutive 10 seconds (SW·VHA only)	① Incorrect switch settings on the outdoor controller circuit board for model select ② Defective outdoor power circuit board ③ Defective outdoor controller circuit board	① Correction of a model select ② Replace outdoor power circuit board. ③ Replace outdoor controller circuit board.
Ud	**Overheat protection** Abnormal if liquid thermistor (TH3), condensing temperature T_{63HS} detects 70˚C or more during compressor operation.		① Defective outdoor fan (fan motor) or short cycle of outdoor unit during cooling operation ② Defective liquid thermistor (TH3), condensing temperature T_{63HS} ③ Defective outdoor controller board	① Check outdoor unit air passage. ②③ Turn the power off and on again to check the error code. If U4 is displayed, follow the U4 processing direction.
UE	**Abnormal pressure of pressure sensor (63HS)** Abnormal if pressure sensor (63HS) detects 0.1 MPa or less. Detection is inoperative for 3 minutes after compressor starting and 3 minutes after and during defrosting.		① Disconnection or contact failure of connector (63HS) on the outdoor controller circuit board ② Defective pressure sensor ③ Defective outdoor controller circuit board	① Check connection of connector (63HS) on the outdoor controller circuit board. Check breaking of the lead wire for thermistor (63HS). ② Check pressure by microprocessor. (Pressure sensor/ 63HS) (SW2: Refer to 10-8.) ③ Replace outdoor controller board.
UF	**Compressor overcurrent interruption (When compressor locked)** Abnormal if overcurrent of DC bus or compressor is detected within 30 seconds after compressor starts operating.		① Stop valve is closed. ② Decrease of power supply voltage ③ Looseness, disconnection or converse of compressor wiring connection ④ Defective compressor ⑤ Defective outdoor power board	① Open stop valve. ② Check facility of power supply. ③ Correct the wiring (U·V·W phase) to compressor. Refer to 10-7 (Outdoor power circuit board). ④ Check compressor. Refer to 10-5. ⑤ Replace outdoor power circuit board.
UH	**Current sensor error or input current error** • Abnormal if current sensor detects –1.0A to 1.0A during compressor operation. (This error is ignored in case of test run mode.) • Abnormal if 40A (SW100/120V) of input current is detected or 37A (SW100/120V) or more of input current is detected for 10 seconds continuously.		① Disconnection of compressor wiring ② Defective circuit of current sensor on outdoor power circuit board ③ Decrease of power supply voltage	① Correct the wiring (U·V·W phase) to compressor. Refer to 10-7 (Outdoor power circuit board). ② Replace outdoor power circuit board. ③ Check the facility of power supply.
UL	**Low pressure (63L operated) (SW100/120 only)** Abnormal if 63L is operated (under -0.03MPa) during compressor operation. 63L: Low-pressure switch		① Stop valve of outdoor unit is closed during operation. ② Disconnection or loose connection of connector (63L) on outdoor controller board ③ Disconnection or loose connection of 63L ④ Defective outdoor controller board ⑤ Leakage or shortage of refrigerant ⑥ Malfunction of linear expansion valve	① Check stop valve. ②~④ Turn the power off and on again to check if F3 is displayed on restarting. If F3 is displayed, follow the F3 processing direction. ⑤ Correct to proper amount of refrigerant. ⑥ Check linear expansion valve. Refer to 10-5.

Error Code	Abnormal point and detection method	Case	Judgment and action
UP	**Compressor overcurrent interruption** Abnormal if overcurrent DC bus or compressor is detected after compressor starts operating for 30 seconds.	① Stop valve of outdoor unit is closed. ② Decrease of power supply voltage ③ Looseness, disconnection or converse of compressor wiring connection ④ Defective fan of indoor/outdoor units ⑤ Short cycle of indoor/outdoor units ⑥ Defective input circuit of outdoor controller board ⑦ Defective compressor ⑧ Defective outdoor power circuit board ⑨ Dip switch setting difference of outdoor controller circuit board	① Open stop valve. ② Check facility of power supply. ③ Correct the wiring (U·V·W phase) to compressor. Refer to 10-7 (Outdoor power circuit board). ④ Check indoor/outdoor fan. ⑤ Solve short cycle. ⑥ Replace outdoor controller circuit board. ※ Before the replacement of the outdoor controller circuit board, disconnect the wiring to compressor from the outdoor power circuit board and check the output voltage among phases, U, V, W, during test run. No defect on board if voltage among phases (U-V, V-W and W-U) is same. Make sure to perform the voltage check with same performing frequency. ⑦ Check compressor. Refer to 10-5. ⑧ Replace outdoor power circuit board. ⑨ Check the dip switch setting of outdoor controller circuit board.
E0 or E4	**Remote controller transmission error (E0)/ signal receiving error (E4)** ① Abnormal if main or sub remote controller cannot receive normally any transmission from indoor unit of refrigerant address “0” for 3 minutes. (Error code : E0) ② Abnormal if sub remote controller could not receive any signal for 2 minutes. (Error code: E0) ① Abnormal if indoor controller board can not receive normally any data from remote controller board or from other indoor controller board for 3 minutes. (Error code: E4) ② Indoor controller board cannot receive any signal from remote controller for 2 minutes. (Error code: E4)	① Contact failure at transmission wire of remote controller ② All remote controllers are set as “sub” remote controller. In this case, E0 is displayed on remote controller, and E4 is displayed at LED (LED1, LED2) on the outdoor controller circuit board. ③ Miswiring of remote controller ④ Defective transmitting receiving circuit of remote controller ⑤ Defective transmitting receiving circuit of indoor controller board of refrigerant address “0” ⑥ Noise has entered into the transmission wire of remote controller.	① Check disconnection or looseness of indoor unit or transmission wire of remote controller. ② Set one of the remote controllers “main” if there is no problem with the action above. ③ Check wiring of remote controller. • Total wiring length: Max. 500m (Do not use cable × 3 or more.) • The number of connecting indoor units: Max. 16 units • The number of connecting remote controller: Max. 2 units When it is not the above-mentioned problem of ①~③ ④ Diagnose remote controllers. a) When “RC OK” is displayed, Remote controllers have no problem. Turn the power off, and on again to check. If abnormality generates again, replace indoor controller board. b) When “RC NG” is displayed, Replace remote controller. c) When "RCE3" or "ERC00-66" is displayed, noise may be causing abnormality. * If the unit is not normal after replacing indoor controller board in group control, indoor controller board of address “0” may be abnormal.
E1 or E2	**Remote controller control board** ① Abnormal if data cannot be normally read from the nonvolatile memory of the remote controller control board. (Error code: E1) ② Abnormal if the clock function of remote controller cannot be normally operated. (Error code: E2)	① Defective remote controller	① Replace remote controller.

Error Code	Abnormal point and detection method	Case	Judgment and action
E3 or E5	**Remote controller transmission error (E3)/ signal receiving error (E5)** ① Abnormal if remote controller could not find blank of transmission path for 6 seconds and could not transmit. (Error code: E3) ② Remote controller receives transmitted data at the same time, compares the data, and when detecting it, judges different data to be abnormal 30 continuous times. (Error code: E3) ① Abnormal if indoor controller board could not find blank of transmission path. (Error code: E5) ② Indoor controller board receives transmitted data at the same time, compares the data, and when detecting it, judges different data to be abnormal 30 continuous times. (Error code: E5)	① 2 remote controller are set as "main." (In case of 2 remote controllers) ② Remote controller is connected with 2 indoor units or more. ③ Repetition of refrigerant address ④ Defective transmitting receiving circuit of remote controller ⑤ Defective transmitting receiving circuit of indoor controller board ⑥ Noise has entered into transmission wire of remote controller.	① Set a remote controller to main, and the other to sub. ② Remote controller is connected with only one indoor unit. ③ The address changes to a separate setting. ④~⑥ Diagnose remote controller. a) When "RC OK" is displayed, remote controllers have no problem. Turn the power off, and on again to check. When becoming abnormal again, replace indoor controller board. b) When "RC NG" is displayed, replace remote controller. c) When "RC E3" or "ERC 00-66" is displayed, noise may be causing abnormality.
E6	**Interface unit/Flow temp. controller or outdoor unit communication error (Signal receiving error)** ① Abnormal if Interface unit/Flow temp. controller cannot receive any signal normally for 6 minutes after turning the power on. ② Abnormal if Interface unit/Flow temp. controller cannot receive any signal normally for 3 minutes.	① Contact failure, short circuit or, miswiring (converse wiring) of Interface unit/Flow temp. controller or outdoor unit connecting wire ② Defective transmitting receiving circuit of outdoor controller circuit board ③ Defective transmitting receiving circuit of Interface unit/Flow temp. controller ④ Noise has entered into Interface unit/Flow temp. controller or outdoor unit connecting wire.	* Check LED display on the outdoor controller circuit board. (Connect A-control service tool, PAC-SK52ST.) ① Check disconnection or looseness of Interface unit/Flow temp. controller or outdoor unit connecting wire of Interface unit/Flow temp. controller or outdoor unit. ②~④ Turn the power off, and on again to check. If abnormality generates again, replace Interface unit/Flow temp. controller or outdoor controller circuit board.
E8	**Indoor/outdoor unit communication error (Signal receiving error) (Outdoor unit)** Abnormal if outdoor controller circuit board could not receive anything normally for 3 minutes.	① Contact failure of indoor/ outdoor unit connecting wire ② Defective communication circuit of outdoor controller circuit board ③ Defective communication circuit of indoor controller board ④ Noise has entered into indoor/ outdoor unit connecting wire.	① Check disconnection or looseness of indoor/ outdoor unit connecting wire of indoor or outdoor units. ②~④ Turn the power off, and on again to check. Replace indoor controller board or outdoor controller circuit board if abnormality is displayed again.
E9	**Indoor/outdoor unit communication error (Transmitting error) (Outdoor unit)** ① Abnormal if "0" receiving is detected 30 times continuously though outdoor controller circuit board has transmitted "1". ② Abnormal if outdoor controller circuit board could not find blank of transmission path for 3 minutes.	① Indoor/ outdoor unit connecting wire has contact failure. ② Defective communication circuit of outdoor controller circuit board ③ Noise has entered power supply. ④ Noise has entered indoor/ outdoor unit connecting wire.	① Check disconnection or looseness of indoor/ outdoor unit connecting wire. ②~④ Turn the power off, and on again to check. Replace outdoor controller circuit board if abnormality is displayed again.
EF	**Non defined error code** This code is displayed when non defined error code is received.	① Noise has entered transmission wire of remote controller. ② Noise has entered indoor/ outdoor unit connecting wire. ③ Outdoor unit is not inverter models. ④ Model name of remote controller is PAR-S25A.	①② Turn the power off, and on again to check. Replace indoor controller board or outdoor controller circuit board if abnormality is displayed again. ③ Replace outdoor unit with inverter type outdoor unit. ④ Replace remote controller with MA remote controller.
Ed	**Serial communication error** ① Abnormal if serial communication between outdoor controller circuit board and outdoor power circuit board is defective.	① Breaking of wire or contact failure of connector CN2 between the outdoor controller circuit board and the outdoor power circuit board ② Breaking of wire or contact failure of connector CN4 between the outdoor controller circuit board and the outdoor power circuit board ③ Defective communication circuit of outdoor power circuit board ④ Defective communication circuit of outdoor controller circuit board for outdoor power circuit board	①② Check connection of each connector CN2 and CN4 between the outdoor controller circuit board and the outdoor power circuit board. ③ Replace outdoor power circuit board. ④ Replace outdoor controller circuit board.

Error Code	Abnormal point and detection method	Case	Judgment and action
P6	**Freezing/overheating protection is working** Overheating protection <Heating mode> Abnormal if condensing temperature of pressure sensor (63HS) detects Tcond. °C or more and compressor operation frequency is less than or equal to 25 Hz. Detection is inoperative during defrosting.	① Overcharge of refrigerant ② Defective refrigerant circuit (clogs) ③ Malfunction of linear expansion valve ④ Reduced water flow · Clogged filter · Leakage of water ⑤ High temperature · Over-load · Inlet water is too warm. ⑥ Defective water pump	①② Check operating condition of refrigerant circuit. ③ Check linear expansion valve. ④⑤ Check water piping. ⑥ Check water pump.
P9	**Actual tank temperature thermistor (TH5)** ① The unit is 3-minute resume prevention mode if short/open of thermistor is detected. Abnormal if the unit does not reset normally after 3 minutes. (The unit returns to normal operation, if it has been reset normally) ② Constantly detected during cooling, heating, heating ECO, anti freeze and hot water operation.	① Defective thermistor characteristics ② Contact failure of TB61 No. 5-6 on PCB of interface unit/Flow temp. controller ③ Breaking of wire or contact failure of thermistor wiring ④ Defective PCB of interface unit/Flow temp. controller	①–③ Check resistance value of thermistor. 0℃ 15.0kΩ 30℃ 4.3kΩ 10℃ 9.6kΩ 40℃ 3.0kΩ 20℃ 6.3kΩ If you put force on (draw or bend) the lead wire with measuring resistance value of thermistor, breaking of wire or contact failure can be detected. ② Check contact failure of TB61 No.5-6 on PCB of Interface unit/Flow temp. controller. Refer to 7. WIRING DIAGRAM. Turn the power on again and check restart after inserting connector again. ④ Check actual tank temperature display on remote controller. Replace PCB of Interface unit/Flow temp. controller if there is abnormal difference with actual tank temperature. Turn the power off, and on again to operate after check.



Tcond	stage-a	stage-b	stage-c	stage-d	stage-e	stage-f	stage-g
SW75	63	61	60	58	56	53	50
SW100/120	63	62	61	60	59	57	51

10-4. TROUBLESHOOTING

Phenomena	Factor	Countermeasure
1. Remote controller display does not work.	①DC12V is not supplied to remote controller. (Power supply display ⦿ is not indicated on LCD.)	① Check LED2 on indoor controller board. (1) When LED2 is lit. Check the remote controller wiring for breaking or contact failure. (2) When LED2 is blinking. Check short circuit of remote controller wiring. (3) When LED2 is not lit. Refer to No.3 below.
	②DC12~15V is supplied to remote controller, however, no display is indicated. • "PLEASE WAIT" is not displayed. • "PLEASE WAIT" is displayed.	② Check the following. • Failure of remote controller if "PLEASE WAIT" is not displayed • Refer to No.2 below if "PLEASE WAIT" is displayed.
2. "PLEASE WAIT" display is remained on the remote controller.	① At longest 2 minutes after the power supply "PLEASE WAIT" is displayed to start up. ② Communication error between the remote controller and indoor unit ③ Communication error between the indoor and outdoor unit	① Normal operation ② Self-diagnosis of remote controller ③ "PLEASE WAIT" is displayed for 6 minutes at most in case of indoor/outdoor unit communication error. Check LED3 on indoor controller board. (1) When LED3 is not blinking. Check indoor/outdoor connecting wire for miswiring. (Converse wiring of S1 and S2, or break of S3 wiring.) (2) When LED3 is blinking. Indoor/outdoor connecting wire is normal.
	④ Outdoor unit protection device connector is open.	④ Check LED display on outdoor controller circuit board. Refer to 10-8. Check protection device connector (63L and 63H) for contact failure. Refer to 10-7.

Phenomena	Factor	Countermeasure
3. When pressing the remote controller operation switch, the OPERATION display is appeared but it will be turned off soon.	① After cancelling to select function from the remote controller, the remote controller operation switch will be not accepted for approx. 30 seconds.	① Normal operation
4. Even controlling by the wireless remote controller, no beep is heard and the unit does not start operating. Operation display is indicated on wireless remote controller.	①The pair number settings of the wireless remote controller and indoor controller board are mismatched.	①Check the pair number settings.
5. When operating by the wireless remote controller, beep sound is heard, however, unit does not start operating.	①No operation for 2 minutes at most after the power supply ON. ②Local remote controller operation is prohibited. • Remote controlling adaptor is connected to CN32 on the indoor controller board. • Local remote controller operation is prohibited by centralised controller etc. since it is connected to MELANS. ③Phenomena of No.2.	①Normal operation ②Normal operation ③Check the phenomena No.2.
6. Remote controller display works normally and the unit performs cooling operation, however, the capacity cannot be fully obtained. (The air does not cool well.)	①Refrigerant shortage ②Filter clogging ③Heat exchanger clogging ④Air duct short cycle	①• If refrigerant leaks, discharging temperature rises and LEV opening increases. Inspect leakage by checking the temperature and opening. • Check pipe connections for gas leakage. ②Open intake grille and check the filter. Clean the filter by removing dirt or dust on it. ③• If the filter is clogged, indoor pipe temperature rises and discharging pressure increases. Check if heat exchanger is clogged by inspecting discharging pressure. • Clean the heat exchanger. ④Remove the blockage.
7. Remote controller display works normally and the unit performs heating operation, however, the capacity cannot be fully obtained.	①Linear expansion valve fault Opening cannot be adjusted well due to linear expansion valve fault. ②Refrigerant shortage ③Lack of insulation for refrigerant piping ④Filter clogging ⑤Heat exchanger clogging ⑥Air duct short cycle ⑦Bypass circuit of outdoor unit fault	①• Discharging temperature and indoor heat exchanger temperature does not rise. Inspect the failure by checking discharging pressure. • Replace linear expansion valve. ②• If refrigerant leaks, discharging tempera ture rises and LEV opening increases. Inspect leakage by checking the temperature and opening. • Check pipe connections for gas leakage. ③Check the insulation. ④Open intake grille and check the filter. Clean the filter by removing dirt or dust on it. ⑤• If the filter is clogged, indoor pipe temperature rises and discharging pressure increases. Check if heat exchanger is clogged by inspecting discharging pressure. • Clean the heat exchanger. ⑥Remove the blockage. ⑦Check refrigerant system during operation.
8. ①For 3 minutes after temperature adjuster turns off, the compressor will not start operating even if temperature adjuster is turned on. ②For 3 minutes after temperature adjuster turns on, the compressor will not stop operating even if temperature adjuster is turned off. (Compressor stops operating immediately when turning off by the remote controller.)	①②Normal operation (For protection of compressor)	①②Normal operation

Phenomena	Countermeasure
A flowing water sound or occasional hissing sound is heard.	■ These sounds can be heard when refrigerant and/or water is (are) flowing in the indoor unit or refrigerant pipe, or when the refrigerant and/or water is (are) chugging.
Water does not heat or cool well.	■ Clean the filter of water piping. (Flow is reduced when the filter is dirty or clogged.) ■ Check the temperature adjustment and adjust the set temperature. ■ Make sure that there is plenty of space around the outdoor unit.
Water or vapour is emitted from the outdoor unit.	■ During cooling mode, water may form and drip from the cool pipes and joints. ■ During heating mode, water may form and drip from the heat exchanger of outdoor unit. ■ During defrosting mode, water on the heat exchanger of outdoor unit evaporates and water vapour may be emitted.
The operation indicator does not appear in the remote controller display.	■ Turn on the power switch. "◉" will appear in the remote controller display.
"▨" appears in the remote controller display.	■ During external signal control, "▨" appears in the remote controller display and FTC operation cannot be started or stopped using the remote controller.
When restarting the outdoor unit soon after stopping it, it does not operate even though the ON/OFF button is pressed.	■ Wait approximately 3 minutes. (Operation has stopped to protect the outdoor unit.)
FTC operates without the ON/OFF button being pressed.	■ Is the on timer set? Press the ON/OFF button to stop operation. ■ Is the FTC connected to a external signal? Consult the concerned people who control the FTC. ■ Does "▨" appear in the remote controller display? Consult the concerned people who control the FTC. ■ Has the auto recovery feature from power failures been set? Press the ON/OFF button to stop operation.
FTC stops without the ON/OFF button being pressed.	■ Is the off timer set? Press the ON/OFF button to restart operation. ■ Is the air conditioner connected to a central remote controller? Consult the concerned people who control the FTC. ■ Does "▨" appear in the remote controller display? Consult the concerned people who control the FTC.
Remote controller timer operation cannot be set.	■ Are timer settings invalid? If the timer can be set, (WEEKLY) , (SIMPLE) , or (AUTO OFF) appears in the remote controller display.
"PLEASE WAIT" appears in the remote controller display.	■ The initial settings are being performed. Wait approximately 3 minutes. ■ If the remote controller is not only for FTC, change it.
An error code appears in the remote controller display.	■ The protection devices have operated to protect the FTC and outdoor unit. ■ Do not attempt to repair this equipment by yourself. Turn off the power switch immediately and consult your dealer. Be sure to provide the dealer with the model name and information that appeared in the remote controller display.

• If the unit cannot be operated properly after test run, refer to the following table to find the cause.

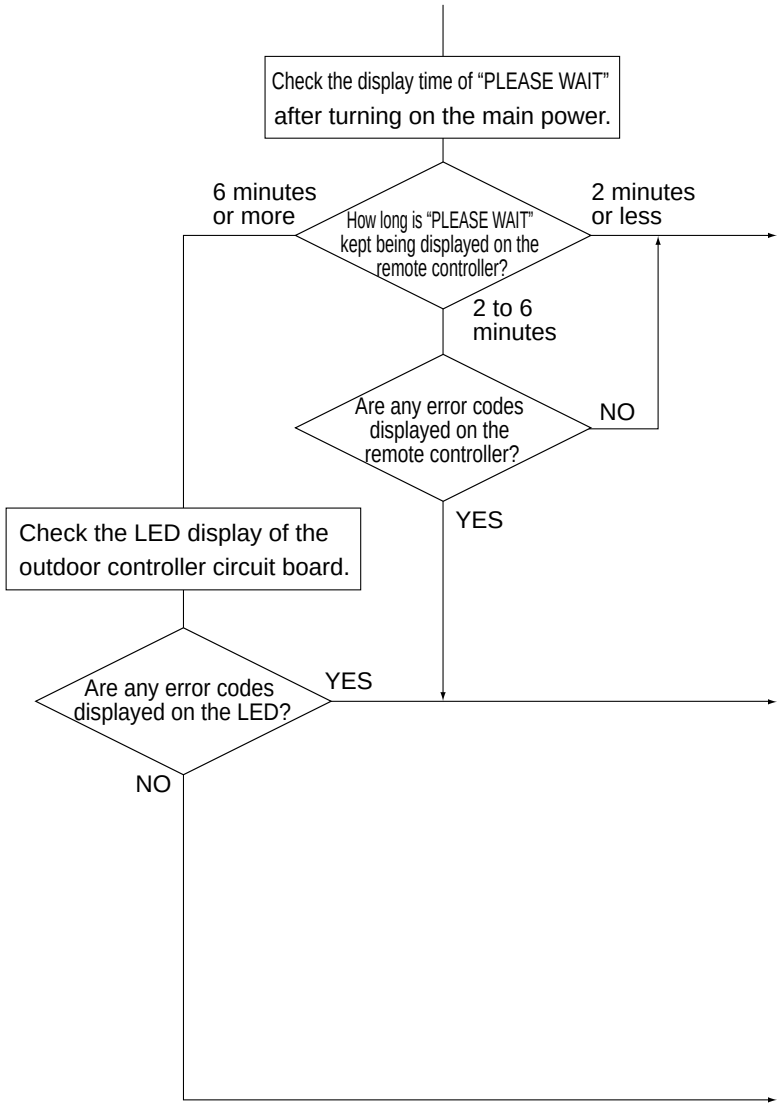
Symptom			Cause
Wired remote controller		LED 1, 2 (PCB in outdoor unit)	
PLEASE WAIT	For about 2 minutes after power-on	After LED 1, 2 are lighted, LED 2 is turned off, then only LED 1 is lighted. (Correct operation)	• For about 2 minutes following power-on,operation of the remote controller is not possible due to system start-up. (Correct operation)
PLEASE WAIT → Error code	Subsequent to about 2 minutes after power-on	Only LED 1 is lighted. → LED 1, 2 blink.	• Connector for the outdoor unit's protection device is not connected. • Reverse or open phase wiring for the outdoor unit's power terminal block (L1, L2, L3)
Display messages do not appear even when operation switch is turned ON (operation lamp does not light up).		Only LED 1 is lighted. → LED 1 blinks twice, LED 2 blinks once.	• Incorrect wiring between FTC and outdoor (incorrect polarity of S1, S2, S3) • Remote controller wire short

Note: Operation is not possible for about 30 seconds after cancellation of function selection. (Correct operation)

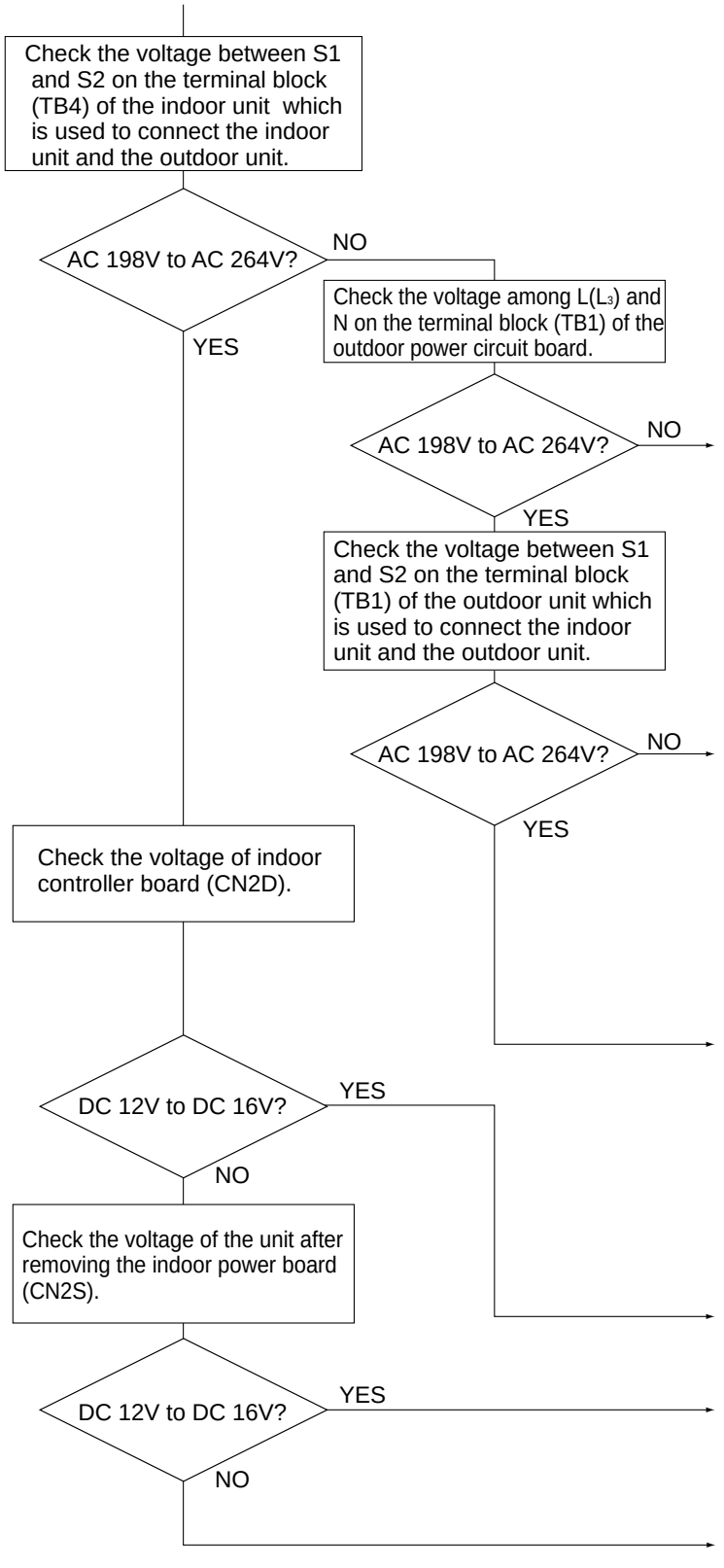
For description of each LED (LED1, 2, 3) provided on the FTC, refer to the following table.

LED1 (power for microprocessor)	Indicates whether control power is supplied. Make sure that this LED is always lit.
LED2 (power for remote controller)	Indicates whether power is supplied to the remote controller. This LED lights only in the case of the FTC which is connected to the outdoor unit refrigerant addresses "0".
LED3 (communication between FTC and outdoor units)	Indicates state of communication between the FTC and outdoor units. Make sure that this LED is always blinking.

Symptoms: “PLEASE WAIT” is kept being displayed on the remote controller.

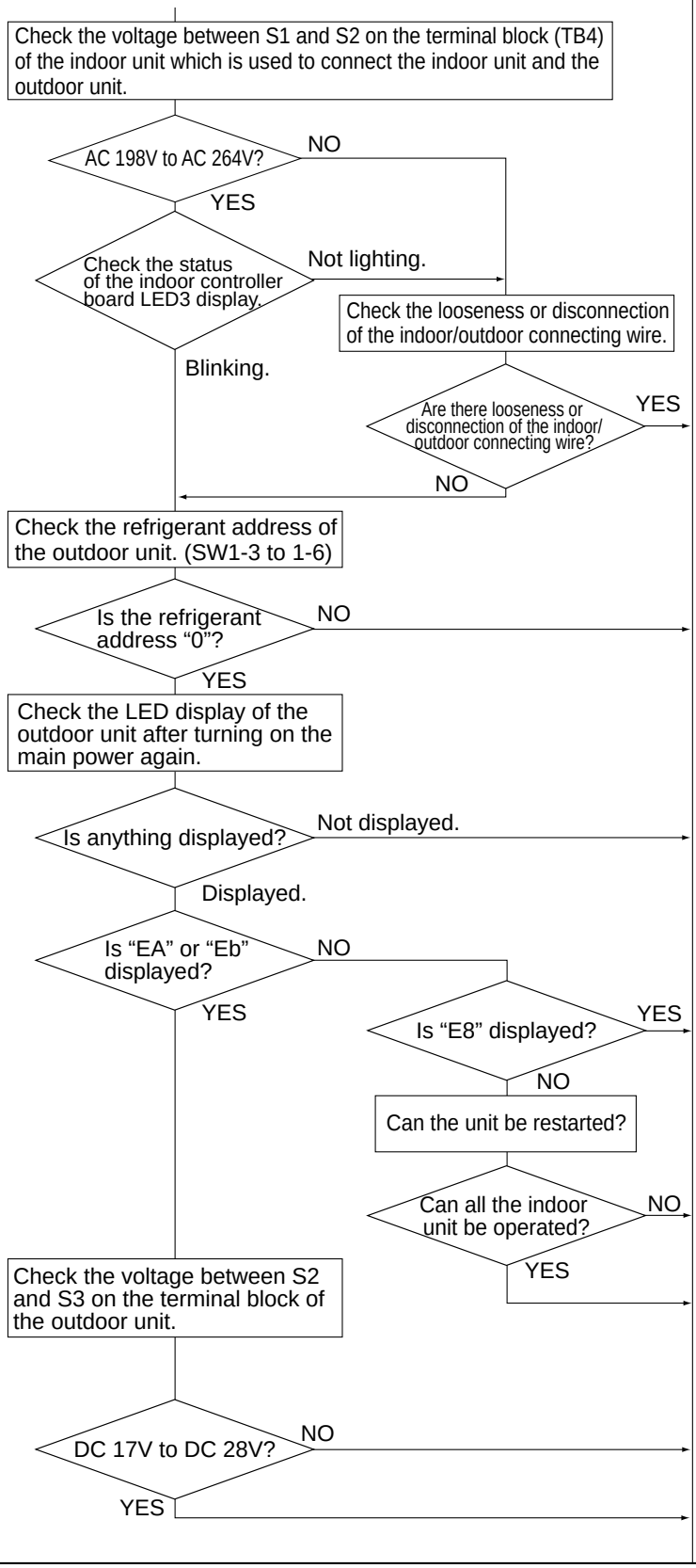
Diagnosis flow	Cause	Inspection method and troubleshooting
	• “PLEASE WAIT” will be displayed during the start-up diagnosis after turning on the main power. • Miswiring of indoor/ outdoor connecting wire • Breaking of indoor/ outdoor connecting wire (S3) • Defective indoor controller board • Defective outdoor controller circuit board • Defective indoor controller board • Defective remote controller	• Normal. The start-up diagnosis will be over in around 2 minutes. • Refer to “Self-diagnosis action table” in order to solve the trouble. • In case of communication errors, the display of remote controller may not match the LED display of the outdoor unit.

Symptoms: Nothing is displayed on the remote controller ①	LED display of the indoor controller board LED1 : ○ LED2 : ○ LED3 : ○

Diagnosis flow	Cause	Inspection method and troubleshooting
	• Troubles concerning power supply. • Bad wiring of the outdoor controller board. • The fuses on the outdoor controller circuit board are blown. • Bad wiring of the outdoor controller board. • The fuses on the outdoor controller circuit board are blown. • Defective indoor controller board • Miswiring, breaking or poor connection of in door/outdoor connecting wire • Defective indoor power board	• Check the power wiring to the outdoor unit. • Check the breaker. • Check the wiring of the outdoor unit. • Check if the wiring is bad. Check if the fuses are blown. The fuses on the outdoor controller circuit board will be blown when the indoor /outdoor connecting wire short-circuits. • Check if miswiring, breaking or poor contact is causing this problem. Indoor/outdoor connecting wire is polarized 3-core type. Connect the indoor unit and the outdoor unit by wiring each pair of S1, S2 and S3 on the both side of indoor/outdoor terminal blocks. • Replace the indoor controller board. • Check if there is miswiring or breaking of wire. • Replace the indoor power board.

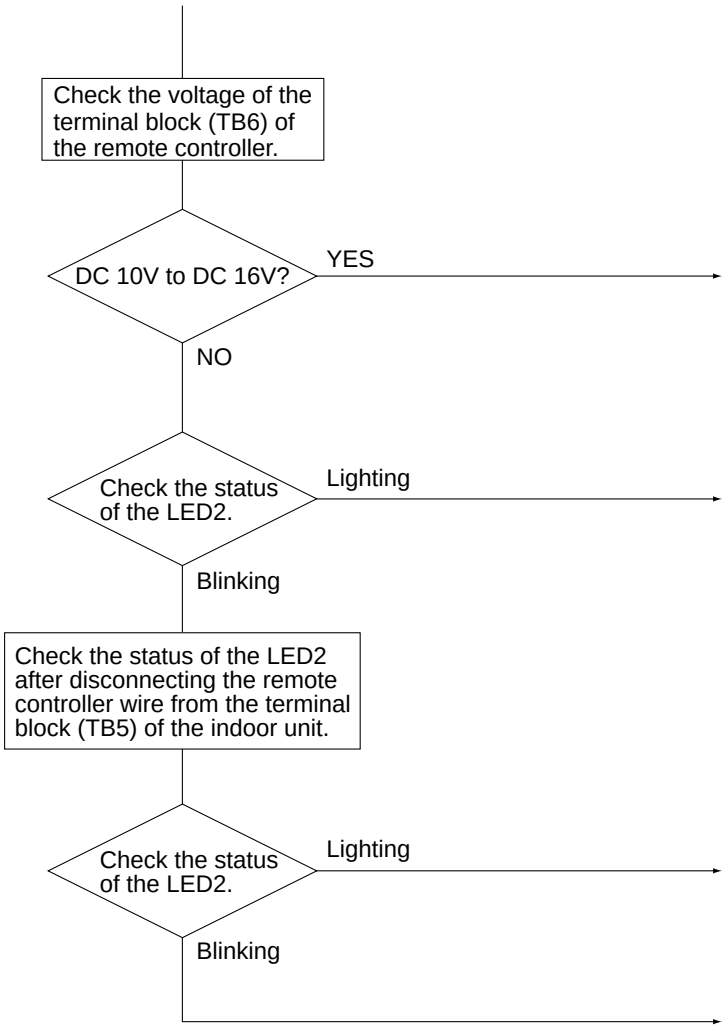
Symptoms: Nothing is displayed on the remote controller ②

LED display of the indoor controller board
LED1 : ☀
LED2 : ○
LED3 : ○ or ◐


Check the voltage between S1 and S2 on the terminal block (TB4) of the indoor unit which is used to connect the indoor unit and the outdoor unit.
AC 198V to AC 264V?
NO
YES
Check the status of the indoor controller board LED3 display.
Not lighting.
Check the looseness or disconnection of the indoor/outdoor connecting wire.
Blinking.
Are there looseness or disconnection of the indoor/ outdoor connecting wire?
YES
NO
Check the refrigerant address of the outdoor unit. (SW1-3 to 1-6)
Is the refrigerant address "0"?
NO
YES
Check the LED display of the outdoor unit after turning on the main power again.
Is anything displayed?
Not displayed.
Displayed.
Is "EA" or "Eb" displayed?
NO
YES
Is "E8" displayed?
YES
NO
Can the unit be restarted?
Can all the indoor unit be operated?
NO
YES
Check the voltage between S2 and S3 on the terminal block of the outdoor unit.
DC 17V to DC 28V?
NO
YES

Cause	Inspection method and troubleshooting
• Breaking or poor contact of the indoor/outdoor connecting wire	• Fix the breaking or poor contact of the indoor/outdoor connecting wire.
• Normal. Only the unit which has the refrigerant address "0" supplies power to the remote controller.	• Set the refrigerant address to "0". In case of the multiple grouping system, recheck the refrigerant address again.
• Defective outdoor controller circuit board	• Replace the outdoor controller circuit board.
• Defective outdoor controller circuit board	• Replace the outdoor controller circuit board.
• Defective indoor controller board	• Replace the indoor controller board of the indoor unit which doesn't operate.
• Influence of electromagnetic noise	• Not abnormal. There may be the influence of electromagnetic noise. Check the transmission wire and get rid of the causes.
• Defective outdoor power circuit board	• Replace the outdoor power circuit board.
• Defective indoor power board	• Replace the indoor power board.

Symptoms: Nothing is displayed on the remote controller ③	LED display of the indoor controller board LED1 : ☀ LED2 : ◐ or ☀ LED3 : —

Diagnosis flow	Cause	Inspection method and troubleshooting
	• Defective remote controller • Breaking or poor contact of the remote controller wire • The remote controller wire short-circuits • Defective indoor controller board	• Replace the remote controller. • Check if there is breaking or poor contact of the remote controller wire. Check the voltage of the terminal block (TB5) connecting the remote controller wire. If it is not between DC 10V and DC16V, the indoor controller board must be defective. • Check if the remote controller wire is short-circuited. • Replace the indoor controller board.

• **Before repair**

Frequent calling from customers

Phone Calls From Customers		How to Respond	Note
Unit does not operate at all.	① The operating display of remote controller does not come on.	① Check if power is supplied to air conditioner. Nothing appears on the display unless power is supplied.	———
	② Unit cannot be restarted for a while after it's stopped.	② Wait around 3 minutes to restart unit. The air conditioner is in a state of being protected by the microcomputer's directive. Once the compressor is stopped, the unit cannot be restarted for 3 minutes. This control is also applied when the unit is turned on and off by remote controller.	———
	③ Error code appears and blinks on the display of remote controller.	③ Error code will be displayed if any protection devices of the air conditioner are actuated. What is error code? ----------▶	Refer to "SELF-DIAGNOSIS ACTION TABLE". ▶Check if servicing is required for the error.
Remote controller	① "PLEASE WAIT" is displayed on the screen.	① Wait around 2 minutes. An automatic startup test will be conducted for 2 minutes when power is supplied to the air conditioner. "PLEASE WAIT" will be kept being displayed while that time.	———
	② "FILTER" is displayed on the screen.	② This indicates that it is time to clean the air filters. Clean the air filters. Press the FILTER button on the remote controller twice to clear "FILTER" from the display. See the operation manual that came with the product for how to clean the filters.	Display time of "FILTER" depends on the model. Long life filter: 2500 hrs. Regular filter: 100 hrs.
	③ "STANDBY" is displayed on the screen.	③ This is displayed when the unit starts HEAT operation, when the thermostat puts the compressor in operation mode, or when the outdoor unit ends DEFROST operation and returns to HEAT operation. The display will automatically disappear around 10 minutes later. While "STANDBY" is displayed on the remote controller, the airflow amount will be restricted because the indoor unit's heat exchanger is not fully heated up. In addition to that, the up/down vane will be automatically set to horizontal blow in order to prevent cold air from directly blowing out to human body. The up/down vane will return to the setting specified by the remote controller when "STANDBY" is released.	———
	④ "DEFROST" is displayed on the screen. (No air comes out of the unit.)	④ The outdoor unit gets frosted when the outside temperature is low and the humidity is high. "DEFROST" indicates the DEFROST operation is being performed to melt this frost. The DEFROST operation ends in around 10 minutes (at most 15 minutes). During the DEFROST operation, the indoor unit's heat exchanger becomes cold, so the fan is stopped. The up/down vane will be automatically set to horizontal blow in order to prevent cold air from directly blowing out to human body. The display will turn into "STANDBY" when DEFROST operation ends.	———

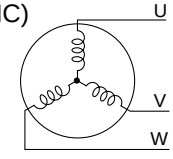
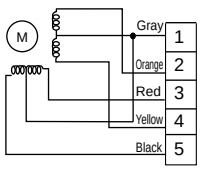
Phone Calls From Customers		How to Respond	Note
The room cannot be cooled or heated sufficiently.		① Check the set temperature of remote controller. The outdoor unit cannot be operated if the set temperature is not appropriate. The outdoor unit operates in the following modes. COOL: When the set temperature is lower than the room temperature. HEAT: When the set temperature is higher than the room temperature.	———
		② Check if filters are not dirty and clogged. If filters are clogged, the airflow amount will be reduced and the unit capacity will be lowered. See the instruction manual that came with the product for how to clean the filters.	———
		③ Check there is enough space around the air conditioner. If there are any obstacles in the air intake or air outlet of indoor/outdoor units, they block the airflow direction so that the unit capacity will be lowered.	———
Sound comes out from the air conditioner.	① An gas escaping sound is heard sometimes.	① This is not a malfunction. This is the sound which is heard when the flow of refrigerant in the air conditioner is switched.	———
	② A cracking sound is heard sometimes.	② This is not a malfunction. This is the sound which is heard when internal parts of units expand or contract when the temperature changes.	———
	③ A buzzing sound is heard sometimes.	③ This is not a malfunction. This is the sound which is heard when the outdoor unit starts operating.	———
	④ A ticking sound is heard from the outdoor unit sometimes.	④ This is not a malfunction. This is the sound which is heard when the fan of the outdoor unit is controlling the airflow amount in order to keep the optimum operating condition.	———
	⑤ A sound, similar to water flowing, is heard from the unit.	⑤ This is not a malfunction. This is the sound which is heard when the refrigerant is flowing inside the indoor unit.	———
Something is wrong with the blower…..	① The fan speed does not match the setting of the remote controller during DRY operation.(No air comes out sometimes during DRY operation.)	① This is not a malfunction. During the DRY operation, the blower's ON/OFF is controlled by the microcomputer to prevent overcooling and to ensure efficient dehumidification. The fan speed cannot be set by the remote controller during DRY operation.	———
	② The fan speed doesn't match the setting of the remote controller in HEAT operation.	② This is not a malfunction. 1) When the HEAT operation starts, to prevent the unit from blowing cold air, the fan speed is gradually increased from zero to the set speed, in proportion to the temperature rise of the discharged air. 2) When the room temperature reaches the set temperature and the outdoor unit stops, the unit starts the LOW AIR operation. 3) During the HEAT operation, the DEFROST operation is performed to defrost the outdoor unit. During the DEFROST operation, the blower is stopped to prevent cold air coming out of the indoor unit.	The up/down vane will be automatically set to horizontal blow in these cases listed up on the left (①~③). After a while, the up/down vane will be automatically moved according to the setting of the remote controller.

Phone Calls From Customers		How to Respond	Note
Something is wrong with the blower…..	③ Air blows out for a while after HEAT operation is stopped.	③ This is not a malfunction. The blower is operating just for cooling down the heated-up air conditioner. This will be done within 1 minute. This control is conducted only when the HEAT operation is stopped with the electric heater ON.	However, this control is also applied to the models which has no electric heater.
Something is wrong with the airflow direction….	① The airflow direction is changed during COOL operation.	① If the up/down vane is set to downward in COOL operation, it will be automatically set to horizontal blow by the microcomputer in order to prevent water from dropping down. "1 Hr." will be displayed on the remote controller if the up/down vane is set to downward with the fan speed set to be less than "LOW".	———
	② The airflow direction is changed during HEAT operation. (The airflow direction cannot be set by remote controller.)	② In HEAT operation, the up/down vane is automatically controlled according to the temperature of the indoor unit's heat exchanger. In the following cases written below, the up/down vane will be set to horizontal blow, and the setting cannot be changed by remote controller. 1) At the beginning of the HEAT operation 2) While the outdoor unit is being stopped by thermostat or when the outdoor unit gets started to operate. 3) During DEFROST operation The airflow direction will be back to the setting of remote controller when the above situations are released.	"STANDBY" will be displayed on the remote controller in case of ① and ②. "DEFROSTING" will be displayed on the screen in case of ③.
	③ The airflow direction doesn't change. (Up/down vane, left/right louver)	③ 1) Check if the vane is set to a fixed position. (Check if the vane motor connector is removed.) 2) Check if the air conditioner has a function for switching the air direction. 3) If the air conditioner doesn't have that function, "NOT AVAILABLE" will be displayed on the remote controller when "AIR DIRECTION" or "LOUVER" button is pressed.	———
The air conditioner starts operating even though any buttons on the remote controller are not pressed.		① Check if you set ON/OFF timer. The air conditioner starts operating at the time designated if ON timer has been set before.	———
		② Check if any operations are ordered by distant control system or the central remote controller. While "CENTRALLY CONTROLLED INDICATOR" is displayed on the remote controller, the air conditioner is under the control of external directive.	There might be a case that "CENTRALLY CONTROLLED INDICATOR" will not be displayed.
		③ Check if power is recovered from power failure (black out). The units will automatically start operating when power is recovered after power failure (black out) occurs. This function is called "auto recovery feature from power ".	———
The air conditioner stops even though any buttons on the remote controller are not pressed.		① Check if you set ON/OFF timer. The air conditioner stops operating at the time designated if OFF timer has been set before. ② Check if any operations are ordered by distant control system or the central remote controller. While "CENTRALLY CONTROLLED INDICATOR" is displayed on the remote controller, the air conditioner is under the control of external directive.	There might be a case that "CENTRALLY CONTROLLED INDICATOR" will not be displayed.

Phone Calls From Customers	How to Respond	Note
A white mist is expelled from the indoor unit.	This is not a malfunction. This may occur when the operation gets started in the room of high humidity.	———
Water or moisture is expelled from the outdoor unit.	Cooling; when pipes or piping joints are cooled, they get sweated and water drips down. Heating; water drips down from the heat exchanger. * Make use of optional parts “Drain Socket” and “Drain pan” if these water needs to be collected and drained out for once.	———
The display of wireless remote controller gets dim or doesn not come on. The indoor unit does not receive a signal from remote controller at a long distance.	Batteries are being exhausted. Replace them and press the reset button of remote controller.	———

10-5. HOW TO CHECK THE PARTS

PUHZ-SW75VHA(-BS).UK
PUHZ-SW100VHA(-BS).UK **PUHZ-SW120VHA(-BS).UK**
PUHZ-SW100YHA(-BS).UK **PUHZ-SW120YHA(-BS).UK**

<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Thermistor (TH3)
<Liquid>
Thermistor (TH4)
<Discharge>
Thermistor (TH6)
<2-phase pipe>
Thermistor (TH7)
<Ambient>
Thermistor (TH8)
<Heatsink>
Thermistor (TH34)
<Comp. surface></td><td>Disconnect the connector then measure the resistance with a tester.
(At the ambient temperature 10℃ - 30℃)
<table>
<tr><th></th><th>Normal</th><th>Abnormal</th></tr>
<tr><td>TH4
TH34</td><td>160kΩ - 410kΩ</td><td rowspan="3">Open or short</td></tr>
<tr><td>TH3
TH6
TH7</td><td>4.3kΩ - 9.6kΩ</td></tr>
<tr><td>TH8</td><td>39kΩ - 105kΩ</td></tr>
</table></td></tr>
<tr><td>Fan motor
(MF1,MF2)</td><td>Refer to next page.</td></tr>
<tr><td>Solenoid valve coil
<Four-way valve>
(21S4)</td><td>Measure the resistance between the terminals with a tester.
(At the ambient temperature 20℃)
<table>
<tr><th>Normal</th><th>Abnormal</th></tr>
<tr><td>1435±150Ω</td><td>Open or short</td></tr>
</table></td></tr>
<tr><td>Motor for compressor
(MC)
 
</td><td>Measure the resistance between the terminals with a tester.
(Winding temperature 20℃)
<table>
<tr><th colspan="3">Normal</th><th>Abnormal</th></tr>
<tr><td>SW75V</td><td>SW100/120V</td><td>SW100/120Y</td><td rowspan="2">Open or short</td></tr>
<tr><td>0.88 Ω</td><td>0.19 Ω</td><td>0.30 Ω</td></tr>
</table></td></tr>
<tr><td>Linear expansion valve
(LEV-A/LEV-B/LEV-C)
 
</td><td>Disconnect the connector then measure the resistance with a tester.
(Winding temperature 20℃)
<table>
<tr><th colspan="4">Normal</th><th>Abnormal</th></tr>
<tr><td>Gray - Black</td><td>Gray - Red</td><td>Gray - Yellow</td><td>Gray - Orange</td><td rowspan="2">Open or short</td></tr>
<tr><td colspan="4">46±3Ω</td></tr>
</table></td></tr>
</table>